

## NOTES ON AUSTRALIAN MOSQUITOES (DIPTERA, CULICIDAE).

PART VI. THE GENUS *TRIPTEROIDES* IN THE AUSTRALASIAN REGION.

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(Plates xii-xiii; sixty-nine Text-figures.)

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## INTRODUCTION.

The present paper comprises a revision of the Australasian members of the genus *Tripteroides*, a discussion of subgeneric divisions, the description of fourteen new species, and keys for the identification of both adults and larvae of species known to occur within the region. As much information as is available on the biology of the various species is also included.

The known distribution of the genus extends from India and Ceylon through the Oriental and Australasian Regions into the Pacific as far as New Zealand and Fiji. Southward it extends to Tasmania (one species) and northward to Japan (also only one species recorded). Of the 60 or so species or varieties so far described (including those described as new in this paper) 40 are recorded from the Australasian Region, some five or six species occur in India or Ceylon, five in the Philippines, and nine in the Sunda Islands. Vertically the genus is known to occur from sea-level to a height of at least 2,400 metres (Edwards, 1927).

The circumstances surrounding the collection of most of the New Guinea species are noteworthy. In 1932, a half-day's collecting by Dr. de Rook and Dr. S. L. Brug

at Tanah Merah yielded five new species of nepenthicolous *Tripteroïdes*, later described by Brug in 1934. Previously a collection made by Dr. W. Docters van Leeuwin near the Rouffaer R. and on the Nassau Mts., both areas in the heart of Dutch New Guinea, also yielded five new species of *Tripteroïdes*, but even more interesting is the fact that only one other known species of *Tripteroïdes* and one of *Armigeres* were included in this collection. Recently Lieut.-Col. W. V. King and his assistants at Hollandia (U.S. Army 19th Medical General Laboratory) have, over a period of some four months, made an extensive collection of *Tripteroïdes* and have thus provided the majority of the species herein described as new.

It seems not unlikely, then, that further collecting, perhaps particularly in the interior of New Guinea, should bring to light many more as yet unknown species of this genus. Borneo also, since it is the centre of distribution of the plant genus *Nepenthes* (Lloyd, 1942, p. 51), may possibly be more fruitful of nepenthicolous species than present records indicate.

In habitat the many species conform to a common type. Most species breed in the pitchers of the insectivorous pitcher plants, *Nepenthes* spp. (Brug, 1934, and others), one has been recorded from the floral bracts of *Curcuma* sp. (Zingiberaceae) (Brug, 1934), another in the leaf axils of an Aroid (Paine and Edwards, 1929), others in bamboo stumps (Brug, 1934, and others), and others in treeholes, and as is often the case with mosquitoes whose breeding specializations are towards small accumulations of water in plants as contrasted with ground pools, a few species are to be found in coconut husks (Paine and Edwards, 1929; Lee, 1944) and a few have adopted a semi-domestic habitat and are found in small artificial containers (tins) or even barrels and large tanks (Graham, 1929; Lee, 1944). One of the Australian species has also been recorded from rock pools (Lee, 1944).

Since so many of the known species are nepenthicolous, the question arises as to how they are able to go through the whole of their larval development in a fluid capable of digesting most insects. This problem has been reviewed by Lloyd (1942, p. 79), and at present it appears that some authors consider that such larvae are capable of forming an antipepsin or that peptic digestion is retarded by the presence of neutral salts in the larvae. Others consider that the evidence for the presence of an antipepsin is not conclusive and cannot see that any special problem is involved, since internal parasites of animals are capable of existing in digestive fluids. One may assume, however, that any dead *Tripteroïdes* larvae would be subject to digestive action. Possibly the apparently predatory larvae of many of the nepenthicolous species may also assist in providing material for digestion by the plant.

However, whether or not any problem is involved, it must be pointed out that little if anything has been recorded as to the nature of the association of *Tripteroïdes* to particular species of *Nepenthes*. Seldom is the species of *Nepenthes* recorded in which larvae have been found. Naturally we do not expect to find larvae in the fluid of the pitcher before that organ has opened, but we do not know how long it is before larvae do appear. The length of time a pitcher has been open may affect the digestive capabilities of the fluid enclosed. Some species have the pitcher hooded in such a way that rain cannot possibly enter, others are at least partially open to rain, but whether *Tripteroïdes* larvae are restricted to any particular type or are to be found in all types is not yet clear. So far no *Tripteroïdes*, nor indeed any mosquitoes, have been found in the West Australian *Cephalotus*. In any case some interesting field observations are still to be made.\*

Quite a number of species are known to bite man, and biting records are almost invariably diurnal; one (probably *T. punctolateralis*) on occasion assumes the proportion of a household pest, particularly in isolated settlements in the north-west of Australia. Others occur in such out of the way places that it seems likely that their attacks on man are purely fortuitous and that other animals are involved as the source of their

\* Other genera of mosquitoes have also been recorded from *Nepenthes*, particularly *Megarhinus* and certain species of *Culex*, and certain other Diptera, including several Phoridae and a Chironomid, are among the list of nepenthebiants.

blood meal. In New Guinea, *T. bimaculipes* at least is reasonably common in the bush and bites fairly freely. It was collected in some numbers at Lae by D. O. Atherton in 1944 with *Aedes scutellaris hebrideus*\* Edw., *Armigeres milbensis* Lee, *Armigeres breinli* Tayl., and *Aedes aurimargo* Edw. when experiments were planned to disclose the vector of dengue fever in areas where *Aedes aegypti* Linn. was absent. Had *T. bimaculipes* not been a common sylvan species at the time it would not have been so well represented in these collections. Nevertheless there is no existing evidence to suggest that any member of the genus *Tripteroides* is in any way concerned in the transmission of diseases of man.

Some of the members of the genus are strikingly ornamented species, the others are almost equally conspicuous for their lack of ornamentation. Both ornamented and unornamented species are closely similar in adult structural characters, although wider differentiation is found in larval characters. Certain subdivisions of subgeneric value appear obvious from a study of New Guinea species, but the occurrence of annectant forms in the Oriental Region and on islands of the Pacific interfere with what appear clearly defined natural divisions in the former region. Specific identification within any particular group depends largely on characters which would be considered obscure in many other genera, but although the structure of the male terminalia conforms to a simple pattern in all species, the form of the ninth tergite is subject to valuable specific variations. The range of variation in larval characters within a species is rather great but the major modifications of larval structure are perhaps the most useful as a basis for subgeneric divisions. Also in the adults the form of the wing scaling follows several distinct patterns, which are of considerable use in the grouping of species.

Specifically, amongst the ornamented species, one looks in particular to the colour of the thoracic integument, the colour of the scutal scales, the form of the scaling on the anterior and posterior pronota, and the abdominal adornment, in the identification of individual species. Amongst the unornamented species the length of the proboscis and palpi, the form of wing scaling and scutal scaling and the presence or absence of dorsocentral, prescutellar, posterior pronotal, upper sternopleural and the number of spiracular bristles are characters of importance. The shape of the pale lateral abdominal patches and the colour of the scales of the posterior pronota are also useful. As indicated above, reference to hypopygial characters and to those of the larvae is always helpful in establishing the identity of a species.

Although the larvae of all species have the thoracic and abdominal hairs mostly developed as stellate tufts, there is quite a wide variation in the degree of development. This, however, is seldom of specific importance. Some species have the clypeal spines rather strongly thickened, most have the dorsal head hairs simple, but if branched hairs are present they are usually useful diagnostically. The most striking character of the larval head is found in those species in which the maxilla† is modified to a large, strongly-developed, apparently predatory, clasping organ. Other species have hair 7 of the mesothorax and metathorax modified as a prominent thickened spine. On the terminal segments the development of the lateral comb is particularly useful (although the variation within a species is at times misleading), the branching of the pentad hairs is occasionally important, and the development of the pecten, the branching

\* I have used the subspecies name *hebrideus* to indicate that the New Guinea form is the same as that subspecies. Further work, however, will probably disclose that either *zonatipes* (Walk.) or *scutellaris* (Walk.) will have priority.

† The function of this modified maxilla is not yet clear. It seems obviously an organ associated with predation, and Paine and Edwards (1929, p. 305) note that the larvae of the species called by them *T. filipes* (see below, page 246), were predacious and attacked each other in captivity; and Brug (1934) has suggested that the maxillae may serve to destroy the bodies of metallic green ants which are found in numbers in *Nepenthes* bowls. On the other hand an obviously similar structure in some species of *Trichoprosopon*, e.g., *T. rapax* (D. & K.) from Brazil, is associated with predation on other sabethine species and species of *Culex* living in the leaf bases of Bromeliaceae. It would be most interesting to disclose the use to which this structure is put, particularly as it is so different from the usual modifications for predation found in other culicines, as, for example, the pectinate mouth-brushes of *Aedes alternans* West., *Culex halifaxii* Theo., and more particularly of *Megarhinus* spp.

of the siphonal hairs and the saddle hair are also on occasion used in specific identification. Quite useful at times is the long hair on the ventral siphonal valves.

Finally, difficulty in the identification of species has probably hitherto militated against the collection of biological information concerning individual species. It is hoped that more may now be contributed along these lines and field studies of the genus, particularly relevant to distribution and specializations in habitat, should yield most interesting information. It seems not unlikely that a high degree of specialization in the choice of larval habitat will actually be found; at least the evidence so far available does suggest this. It will be interesting to see how far correlations between species and their larval habitat are able to be carried, for at present it appears that the most widespread species are those whose breeding places are similarly ubiquitous, namely, treeholes and semi-domestic situations.

The present paper is the result of the examination of some 500 adult specimens and a comparable number of larvae or associated larval skins. On the basis of the proposed classification it has been possible to identify almost all the specimens available. Some of the unnamed material constitutes apparently new species, but the specimens available have not been satisfactory for adequate description although a brief account of them is included in the text. Again, when female specimens, unassociated with males or larvae, have originated from isolated localities, such as small islands, it has been deemed wise to withhold identification pending the receipt of material of greater diagnostic value.

Some corrections of my interpretations of inadequately described species are almost inevitable, but it is hoped that the present revision will materially assist in arriving at a satisfactory classification of this previously neglected genus.

#### Genus TRIPTEROIDES Giles.

##### SYNONYMY.

- TRIPTEROIDES Giles 1904. *J. Trop. Med.*, 7: 369. Genotype: *Runchomyia philippinensis* Giles (= *nitidiventer* Giles).
- RACHIONOTOMYIA Theobald 1905. *J. Bombay Nat. Hist. Soc.*, 16: 248. Genotype: *R. ceylonensis* Theo. (= *aranoides* Theo.).
- POLYLEPIDOMYIA Theobald 1905. *Ann. Mus. Nat. Hung.*, 3: 118. Genotype: *P. argenteiventris* Theo.
- COLONEMYIA Leicester 1908. Culicidae of Malaya in *Stud. Inst. Fed. Malay Stat.*, 3: 273. Genotype: *C. coeruleocephala* Leic.
- SKEIROMYIA Leicester 1908. *Loc. cit.*: 248. Genotype: *S. fusca* Leic. (= *aranoides* Theo.).
- SQUAMOMYIA Theobald 1910. *Rec. Ind. Mus.*, 4: 28. Genotype: *S. inornata* Theo. (= *aranoides* Theo.).
- RACHISOURA Theobald 1910. *Monogr. Cul.*, 5: 207. Genotype: *R. sylvestris* Theo. (= *filipes* Walk.).
- MIMETOMYIA Theobald 1910. *Loc. cit.*: 210. Genotype: *M. apicotriangulata* Theo. (= *atripes* Sk.).
- TRICHOLEPTOMYIA Dyar & Shannon 1925. *Insec. Inscit. menst.*, 13: 72. Genotype: *Wyeomyia nepenthicola* Banks.
- MAORIGOELDIA Edwards 1930. *Bull. ent. Res.*, 21: 302. Genotype: *Culex argyropus* Walk.

##### CHARACTERS OF THE GENUS.

###### *Adult.*

*Head*: The scales on the vertex are all broad and flat and there is a row of upright forked scales on the nape. The eyes touch for a long space above the antennae and there is a pair of strong occipital bristles widely separated from the smaller lower orbital ones. The proboscis varies from short and thick to very long and slender, the mouthparts are normal, the palpi variable in length in both sexes. The male antennae are distinctly plumose with the last two segments elongated. In the female the flagellar segments are subequal and the verticillate hairs rather long.

*Thorax*: The pronotal lobes are widely separated, the scutum has central and dorsocentral bristles in one species, dorsocentrals only in others and others again have no dorsocentrals. Most species have the prescutellar group represented by one or more pairs of bristles. A single posterior pronotal may be present (three or four in one species) but others have no such bristle. Spiracular bristles are always present, but

no postspiraculars and at most one or two upper sternopleurals, no lower mesepimerals and a few upper mesepimerals and subalar. The scutal scaling varies from sparse narrow scales to a dense covering of broad spindle-shaped scales. The pleura are largely clothed with broad appressed scales, silvery in some species, white or creamy in others. The scutellar scales are always broad and flat. The postnotum is usually furrowed slightly on either side of the midline, the furrows approaching the midline distally. Except in a very few species the postnotum is bare (minute hairs or even bristles are occasionally present).

*Legs:* The legs are slender with a few short tibial bristles, the hind tibiae are usually shorter than those of the fore or mid leg, and the first hind tarsal segment is usually longer than the tibia. The fore claws of the male are unequal and all claws of the female are simple; the hind tarsi have only one claw in some species. No pulvilli are present.

*Wings:* The upper fork cell is always longer than its stem and narrowed apically. The posterior crossvein is usually situated well before the middle crossvein and the anal vein extends well beyond the base of m-cu on  $Cu_1$ .\* There are no hairs on either surface of the stem vein and at least a partial fringe is present on the squame.

*Abdomen:* The abdomen appears sleek with few hairs except at the tip, both the eighth tergite and sternite of the female being broad and very bristly. The male hypopygium is prominent in most species. The coxite has a slight basal lobe bearing bristles, and the style is simple, long and slender, with a small terminal spine. The ninth tergite is prominent, usually divided into two distinct lobes (in some species a complete fusion of these lobes has occurred) bearing a variable number of strong bristles. The paraprocts are strongly chitinized at the tip, usually with several teeth, and the phallosome is a simple incomplete tube sometimes bearing weakly chitinized internal teeth.

#### *Larva.*

The head is small, the antennae always short and bare with the shaft hair small and placed beyond the middle. The mouthparts are usually unmodified except in the subgenus *Rachisoura* wherein the maxilla is strongly modified. The thorax and abdomen are usually covered with stellate hairs. The metathorax has in most groups a long and strong dorsolateral spine inserted on a plate which itself bears a small spine. The lateral comb consists of a row of teeth (except *T. argyropus*) which may or may not be attached to a plate. The first pentad hair is more strongly developed than the third; the siphon is variable in length, without an acus, and with numerous scattered hairs and spines, the latter forming a rather irregular "false pecten". The anal segment has only one pair of ventral tufts, there is usually a fringe of spines on the distal margin of the saddle and the dorsal subcaudal hair is branched and the ventral single. The anal papillae are well developed, often long.

#### RELATION TO OTHER GENERA.

The genus *Tripteroides* comes closest to the American genus *Trichoprosopon* (as defined by Lane and Cerqueira, 1942) and indeed there is little to separate the two. The range of variation of adult characters appears to be such that all variations found in *Tripteroides* are within the range of those of *Trichoprosopon*. Of particular importance in linking the two are the characters of the male terminalia which are identical in structure, except that somewhat more diversity in the basal lobe of the coxite is to be found in *Trichoprosopon*. In larval characters there is again a decided parallel in the development, in some species of both genera, of enlarged, toothed maxillae. On the other hand there does appear to be a constant difference in that a pecten is always present in *Tripteroides* and absent in *Trichoprosopon*. This does provide an argument for separating the two genera, and apart from this it is always desirable, for the sake of simplified regional taxonomy, to keep separate genera

\* In conformity with the terminology proposal by Lee and Woodhill (1944). Other authors usually refer to this vein as  $Cu_2$ .

which are quite definitely geographically discontinuous and which have no species common to both regions. Were the two genera combined, the subgeneric divisions of either would not be satisfactory for the species from the other region. This is at least an argument against such a union and it seems likely that if the union were made then the primary separation within the composite genus would be into two geographical rather than morphological groups, with each group then subdivided in a manner following the present subgeneric divisions. If this is really the result that would be obtained, then it serves to emphasize that the evolutionary processes involved in the two regions have followed different paths although the closeness of the relationship of the two genera has inevitably resulted in considerable parallelism. To unite the two genera, then, would be to unite the present ends of two diverging, but not greatly divergent, evolutionary trends which are quite unable to come together again by any natural means and which have enjoyed a considerable period of geographic isolation.

#### SUBGENERIC DIVISIONS.

Edwards (1932) has divided the genus *Tripteroides* into four subgenera, namely, *Maorigoeldia*, *Tripteroides*, *Rachisoura* and *Mimeteomyia*. There is no doubt that his divisions of the genus are useful, although his definitions do not apply in their entirety on the data now available.

The subgenus *Maorigoeldia* may be retained as originally defined, since it still only contains the one species from New Zealand. This is *T. argyropa*, which is an ornate species with three to four posterior pronotal bristles, both central and dorsocentral bristles, and larvae without any modifications of maxilla or thoracic hairs and the lateral comb a patch of many scales.

In the subgenus *Tripteroides*, Edwards included all species in which the palpi is very short in both sexes, usually less than one-sixth that of the proboscis which in its turn is slender and usually longer than the abdomen. There is one posterior pronotal bristle and some of the outstanding wing scales are narrow. Most species have dorsocentral bristles and most (all Australasian members of the subgenus) are ornate with silvery markings on thorax, legs and abdomen and azure-blue on the head. The larval maxillae are not specially modified and there is a modified spine on the metathorax and sometimes also on the mesothorax. Two groups are recognized by Edwards:

(a) *aranoides*-group. No dorsocentral bristles are present, the scutal scales are often broad; the white scales of the thorax and abdomen are without silvery reflections and the femora are unspotted. No member of this group is as yet recorded from the Australasian Region. (Edwards included *T. argenteiventris* and *T. atra* in this group but the first is obviously a *Mimeteomyia* and the second merely a synonym of *T. bimaculipes*.)

(b) *nitidiventer*-group. At least one pair of dorsocentral bristles are present and the scutal scales are all narrow. The white scales of the thorax and abdomen have a pronounced silvery lustre and the femora are usually spotted. Most species also have the anterior part of the head azure-blue.

*Rachisoura* appears to be a valid subgenus based particularly on the modified larval maxilla (much enlarged with one very strong terminal tooth and often subsidiary smaller teeth as well). The adults correlated with such larvae have in common their lack of ornate ornamentation together with the outstanding wing scales, at least of veins  $R_1$  to  $R_3$ , dense and broad. Two groups within the subgenus are also recognizable on adult characters:

(a) *filipes*-group. The members of this group have all the outstanding scales of all veins broad and a posterior pronotal bristle is present. The length of the palpi is very variable and there are often small postnotal hairs.

(b) *vanleeuweni*-group. This is characterized particularly by the wing scaling which is broad and dense on veins  $R_1$  to  $R_3$  (as in the *filipes*-group) but on the rest of the veins the outstanding scales are rather sparse and narrow. No posterior pronotal bristle is present.

The subgenus *Mimeteomyia* requires some modification if *T. obscura* and *T. subobscura* are to be included. It would seem best to base this subgenus on the wing scaling particularly, and define it as follows: The outstanding wing scales are all long and narrow, the wing scaling generally is fairly dense; the male palpi are usually almost as long as the proboscis but may be reduced, those of the female are from 0.1 to 0.25 the length of the proboscis, which itself is variable in length. Most species have a posterior pronotal bristle; all are dull coloured species without silvery markings. The larvae lack modified maxillae but have mesothoracic spines in most species, both metathoracic and mesothoracic in some, and a few have neither.

Again, the subgenus is best divided into three groups, two of which remain almost as defined by Edwards:

(a) *atripes*-group. The male palpi are long and the proboscis is not longer than the abdomen. The mesothorax of the larva has a strong spine similar to that of the metathorax. The lateral comb teeth are prominent and at least some of them arise from a lateral chitinous plate.

(b) *caledonica*-group. The male palpi are also long but the proboscis is distinctly longer than the abdomen and very slender. The mesothoracic spine is not developed and the metathoracic spine may be present or absent. The lateral comb teeth do not arise from a chitinous plate.

(c) *obscura*-group. The male palpi are only one-third the length of the proboscis; the latter is short and stout. The larval characters are not known.

All the Australasian species so far described can be relegated to one or other of the above subgenera and groups with the exception of two, namely, *T. subnudipennis* and *T. concinna*. These two species are known from females only, and as they do not readily fit into any of the groups as defined above, it remains to be seen, when males and larvae of these have been discovered, whether they are deserving of a grouping of their own and in which subgenus they should be placed. It is not unlikely that they will prove to be members of the *aranoides*-group of *Tripteroides*, but on the circumstantial evidence of their distribution it is still possible that they will prove to be members of *Rachisoura*.

## LIST OF AUSTRALASIAN SPECIES.

The following is a list of the described species (including those described as new in the present paper) in their arrangement according to subgenera and groupings.

Subgenus <i>Maorigoeldia</i> .	Subgenus <i>Rachisoura</i> .
<i>T. argyropa</i> .	vanleeuweni-group.
Subgenus <i>Tripteroides</i> .	<i>T. kingi</i> .
nitidiventer-group.	<i>T. pallida</i> .
<i>T. alboscuteolata</i> .	<i>T. pilosa</i> .
<i>T. bimaculipes</i> .	<i>T. simplex</i> .
<i>T. brevipalpis</i> .	<i>T. vanleeuweni</i> .
<i>T. distigma</i> .	Subgenus <i>Mimeteomyia</i> .
<i>T. elegans</i> .	atripes-group.
<i>T. littlechildi</i> .	<i>T. atripes</i> .
<i>T. magnesiana</i> .	<i>T. digoelensis</i> .
<i>T. nissauensis</i> .	<i>T. punctolateralis</i> .
<i>T. purpurata</i> .	<i>T. solomonis</i> .
<i>T. quasiornata</i> .	caledonica-group.
<i>T. splendens</i> .	<i>T. argenteiventris</i> .
Subgenus <i>Rachisoura</i> .	<i>T. atra</i> .
filipes-group.	<i>T. caledonica</i> .
<i>T. confusa</i> .	<i>T. collessi</i> .
<i>T. filipes</i> .	<i>T. microlepis</i> .
<i>T. fuliginosa</i> .	<i>T. rotumana</i> .
<i>T. fuscipleura</i> .	<i>T. tasmaniensis</i> .
<i>T. latisquama</i> .	obscura-group.
<i>T. longipalpata</i> .	<i>T. obscura</i> .
<i>T. papua</i> .	<i>T. subobscura</i> .
vanleeuweni-group.	Species not placed in any subgenus.
<i>T. bisquamata</i> .	<i>T. concinna</i> .
<i>T. brevirhynchus</i> .	<i>T. subnudipennis</i> .

## KEYS TO AUSTRALASIAN SPECIES OF TRIPTEROIDES.

## (a) ADULTS.

1. Three or four posterior pronotal bristles present; wings very densely clothed with broad scales; palpi about one-quarter the length of the proboscis with white ring at middle; silvery markings on thorax, legs and abdomen ..... *argyropa*  
 No more than one posterior pronotal bristle; other characters various but wings never as densely scaled and palpi without white ring at middle ..... 2
2. Ornate species with azure-blue band anteriorly on head, silver scaling on pleura and abdomen, and silvery or white spots or bands on femora; palpi very short in both sexes ..... 3  
 Drab species with only white or creamy ornamentation, no blue scaling on head, no silvery markings elsewhere; palpi variable ..... 13
3. Scutal integument black or at least dark distally; scutal scales of uniform colour with integument at least on distal half ..... 4  
 Scutal integument pale, from yellow to light orange; in some species the scutal scales are dark and in strong contrast to the integument, in others they are yellowish-green ..... 8
4. Pronotal lobes clothed with broad black scales only ..... 5  
 Pronotal lobes clothed with narrow black scales or if some broad ones are present narrow ones predominate ..... 7
5. Posterior pronota with broad flat black scales; mesepimeron very dark but with a small patch of silvery scales; abdominal tergite III with a very small apical sublateral patch of silver; lobes of ninth tergite long and narrow with four spines arising well below the distal margin ..... *splendens*  
 Posterior pronota with narrow scales only ..... 6
6. Mesepimeron shining black and bare; abdominal tergites with lateral dull black markings ..... *littlechildi*  
 Mesepimeron dark but at least partly covered with flat silvery scales; no lateral dull black markings on abdominal tergites; lobes of ninth tergite with nine or more irregularly arranged spines of which about three are longer and stronger than the rest ..... *bimaculipes*
7. Scutellum dark scaled; lobes of ninth tergite long and narrow with four or five long spines arising well before the apex ..... *elegans*  
 Scutellum pale scaled; lobes of ninth tergite not separated, bearing a pair of unequal spines on each side ..... *alboscuteolata*
8. Pronotal lobes clothed with fine narrow black scales; abdominal tergites with lateral dull black patches ..... *magnesiata*  
 Pronotal lobes clothed with broad black scales; abdominal tergites without lateral dull black patches ..... 9
9. Posterior pronota clothed with broad flat scales; scutal scaling light greenish; outstanding wing scales rather long and narrow ..... *purpurata*  
 Posterior pronota with narrow scales (if some broad ones are present they are few in number, 1-6); scutal scales various ..... 10
10. Scutum clothed with greenish scales; a roundish dark brown spot above each wing root covered with flat black scales; no silvery markings on abdomen ..... *distigma*  
 Scutal scales dark brown or black; abdomen with silvery markings ..... 11
11. Bases of fork cells level; no broad scales on posterior pronota ..... *brevipalpis*  
 Bases of fork cells not level, that of the posterior cell being distinctly nearer base of the wing; a few broad scales on the posterior pronota ..... 12
12. Lobes of ninth tergite long, deeply separated, with a group of about 10 spines distally, of which a few are longer and stronger than the rest ... *quasiornata*  
 Lobes of ninth tergite not deeply separated, rather broad, with 20 or more fairly even spines distally ..... *nissanensis*
13. Outstanding scales on all wing veins large and broad; wings densely scaled; one posterior pronotal bristle present ..... 14  
 At least some narrow outstanding scales on the posterior veins; posterior pronotal bristle present or absent ..... 19
14. Pleural integument light in colour (yellowish-brown to medium brown) .... 15  
 Pleural integument dark brown or blackish-brown ..... 18
15. Prescutellar bristles numerous (about 7 pairs) ..... *latisquama*  
 No more than 2 pairs of prescutellar bristles ..... 16



16. Hind tibia about 75% length of mid; male palpi one-third length of proboscis ..... *filipes*\*  
 Hind tibia 88% or more length of mid; male palpi two-thirds length of proboscis ..... 17
17. Pleural integument yellowish-brown; hind tibia 94% or more length of mid; lobes of ninth tergite long, narrow, with 7 or 8 spines increasing in length from the inner to the outer margin ..... *confusa*  
 Pleural integument medium brown; hind tibia 88% length of mid; lobes of ninth tergite of only moderate length with 8 or 9 spines of even length ..... *longipalpata*
18. Proboscis equal in length to fore femur; palpi one-sixth to one-eighth length of proboscis; lobes of ninth tergite short with 4 or 5 long bristles distally ..... *fuscipleura*  
 Proboscis slightly longer than fore femur; palpi (of male) one-quarter length of proboscis; lobes of ninth tergite of medium length with 8 or 9 bristles distally which are not markedly longer than the lobe itself ..... *fuliginosa*
19. Veins  $R_1$ ,  $R_2$  and  $R_3$  with broad outstanding scales; the distal portions of the rest of the veins with narrow outstanding scales; no posterior pronotal bristle present ..... 20  
 Wing scaling not as above; posterior pronotal bristle present or absent .... 25
20. Clypeus without scales (male palpi long in *brevirhynchus*) ..... 21  
 Clypeus with a few scattered broad flat scales; male palpi short ..... 23
21. Scales on upper part of posterior pronota curved and hairlike ..... *pilosa*  
 Scales on upper part of posterior pronota broad and flat ..... 22
22. Female palpi one-quarter length of proboscis (male palpi three-quarters); usually 2-3 spiraculars, no prescutellars; posterior pronota dark scaled above ..... *bisquamata*  
 Female palpi slightly longer; 6-8 spiraculars; one pair of prescutellars; posterior pronota dark scaled above ..... *vanleeuweni*  
 Female palpi less than one-quarter length of proboscis; 5-6 spiraculars; 3 pairs of prescutellars; posterior pronota entirely pale scaled ..... *pallida* (females lacking clypeal scales)
23. Scales of posterior pronota pale below, brown on upper part; proboscis longer than fore femur; lobes of ninth tergite moderately large, not widely separated, with 6-8 spines rather irregularly arranged ..... *kingi*  
 Scales of posterior pronota all pale or at most some greyish ones above; proboscis shorter than fore femur ..... 24
24. Lateral abdominal markings distinctly serrate; lobes of ninth tergite undivided ..... *brevirhynchus*†  
 Lateral abdominal markings with an indefinite margin; lobes of ninth tergite separated ..... *pallida*
25. Wing scales small but broad; no narrow outstanding scales on  $R_2$  and  $R_3$ ; some narrow outstanding scales distally on veins  $R_{4+5}$  to  $Cu_1$ ; a posterior pronotal bristle is present ..... 26  
 Wing scaling fairly dense, all outstanding scales on all veins long and narrow including  $R_2$  and  $R_3$  ..... 27
26. Upright forked scales of head all yellow ..... *subnudipennis*  
 Head scales entirely dark at nape ..... *concinna*
27. Proboscis shorter than abdomen (usually less than the fore femur, but if, as it may be in *T. atripes* and closely related species, it is longer than the fore femur, it still appears quite short since the fore femur itself is unusually short) ..... 28  
 Proboscis longer than the abdomen and distinctly longer than the fore femur, slender ..... 33
28. Palpi of both sexes one-third length of proboscis ..... 29  
 Palpi of female less than one-third; those of male more than half length of proboscis ..... 30
29. No posterior pronotal bristle; abdominal markings strongly serrate .. *subobscura*  
 Posterior pronotal bristle present; abdominal markings not serrate .... *obscura*

\* *T. simplex* would probably key out here but it is not sufficiently described for inclusion.† *T. papua* would probably come out here but the description is not sufficiently precise for it to be separated in the key.

30. Dorsocentral bristles present at least on distal portion of scutum ..... 31  
 Dorsocentral bristles absent; spiracular bristles yellow; upper fork cell 3.5 × length of its stem; border of abdominal markings straight ..... *digoelensis*
31. Dorsal head scaling very dark or black; no pale scaling at base of proboscis or palpi ..... 32  
 Dorsal head scaling light fawn; pale scaling at base of proboscis and palpi, particularly in male ..... *punctolateralis*
32. Scutal scaling black ..... *solomonis*  
 Scutal scaling bronzy ..... *atripes*
33. Pleural integument with scaling confined to longitudinal bands ..... 34  
 Scaling of pleura forming an almost complete cover with no tendency to be confined to longitudinal bands ..... 36
34. Scales of pleura in two longitudinal stripes on either side of a longitudinal bare strip. Hind tarsi largely white apically ..... *tasmaniensis*  
 Scales of pleura confined to a median longitudinal band ..... 35
35. Pale apical bands on abdomen conspicuous across dorsum ..... *caledonica*  
 Abdominal pale markings basal and lateral only ..... *rotumana*
36. Venter distinctly banded ..... *collessi*  
 Venter pale, not banded ..... 37
37. Scales of scutum very small and narrow ..... *microlepis*  
 Scales of scutum moderate or large ..... 38
38. Palpi of female one-sixth length of proboscis, extending beyond the clypeus for twice its length; upper fork cell 2.5-3.0 the length of its stem ..... *atra*  
 Palpi of female one-tenth the length of the proboscis, extending beyond clypeus for less than twice its length; palpi of male almost as long as proboscis; upper fork cell about 3.5 the length of its stem ..... *argenteiventris*

## (b) LARVAE.

Since only half of the described species are known in the larval stage this key is of limited value and should always be used in conjunction with the larval descriptions.

1. Lateral comb of eighth abdominal segment a patch of over 100 scales; no thoracic spines present ..... *argyrota*  
 Lateral comb a row of scales, never arranged in a patch ..... 2
2. Maxillae strongly developed with one or more strong apical spines; no thoracic spines present ..... 3  
 Maxillae not greatly enlarged, without strong apical spines; thoracic spines present in most species ..... 10
3. Apical spine of maxilla over twice as long as body of maxilla itself, slender and rounded at tip; ventral portion of anal segment spinose ..... *longipalpata*  
 Apical spine of maxilla less than or scarcely longer than body of maxilla, tapering and pointed; ventral portion of anal segment not spinose ..... 4
4. Lateral comb comprising only a single spine ..... 5  
 Lateral comb of two or more spines ..... 7
5. Siphonal index over 2.0; saddle hair 3-4-branched; ventral siphonal hairs scanty ..... *brevirhynchus*  
 Siphonal index less than 2.0; saddle hair with fewer than 4 branches ..... 6
6. Siphonal index 1.5; 4-5 dorsal hairs on siphon; 6-9 ventral tufts; saddle hair with 2 branches ..... *kingi*  
 Siphonal index 1.0; 2-4 dorsal hairs on siphon; 6 ventral tufts; saddle hair with 3 branches ..... *pallida*
7. Pecten confined to distal half of siphon ..... 8  
 Pecten either basal or extending from near base to apex ..... 9
8. Ventral siphonal valve hair with 4-5 branches; 3-5 lateral comb scales.. *filipes*  
 Ventral siphonal valve hair single ..... *confusa*
9. Pecten of 5-6 spines extending from base to apex; ventral siphonal valve hair with 4 branches; lateral comb with the uppermost spine larger than the rest ..... *bisquamata*  
 Pecten of 5-9 spines on basal portion of the siphon; ventral siphonal valve with 2 branches; lateral comb spines of even size ..... *fuscipleura*
10. Lateral comb arising from a chitinous plate ..... 11  
 No lateral chitinous plate on eighth abdominal segment ..... 15
11. Lateral plates of eighth segment fused dorsally ..... *purpurata*  
 Lateral plates not fused above ..... 12

12. Both mesothoracic and metathoracic spines present ..... 13  
 Only metathoracic spine present ..... *alboscuteolata*
13. Lateral comb extending ventrally below the lateral chitinous plate, the spines stout and blunt ..... 14  
 Lateral comb not extending below the lateral chitinous plate, the spines sharply pointed ..... *solomonis*
14. Head hair A bifid; B 3-branched ..... *punctolateralis*  
 Head hair A 4-branched; B 6-branched ..... *atripes*
15. Either mesothoracic or both mesothoracic and metathoracic spines present .. 16  
 Neither mesothoracic nor metathoracic spines present ..... 22
16. Both mesothoracic and metathoracic spines present ..... 17  
 Only a metathoracic spine present; mesothoracic hairs not obviously modified 20
17. Dorsal hairs of siphon with 5-6 branches ..... *quasiornata*  
 Dorsal hairs of siphon usually bifid ..... 18
18. Dorsal head hairs bifid; saddle hair bifid ..... *brevipalpis*  
 Dorsal head hairs simple; saddle hair with more than two branches ..... 19
19. Branches of stellate tufts ending in divergent points ..... *bimaculipes*  
 Branches of stellate tufts ending in non-divergent points ..... *nissanensis*
20. Siphon clothed with pecten-like spines over greater part of surface .... *collessi*  
 Siphon with normal pecten spines ..... 21
21. Siphonal index 2.0; about 10 ventral hair tufts ..... *rotumana*  
 Siphonal index 3.0; 13-15 ventral tufts ..... *caledonica*
22. All or most of the lateral comb spines sharply pointed ..... *argenteiventris*  
 Lateral comb scales all blunt and fringed ..... *tasmaniensis*

## DESCRIPTIONS OF SPECIES.

## ORNAMENTED SPECIES.

The ornate species of *Tripteroides* with their bright colouration and particularly the silver scaling of the thorax and abdomen are immediately distinguishable from the unornamented species, which lack all ornamentation except white or creamy scaling laterally on the thorax and abdomen. One ornate species belongs to the subgenus *Maorigoeldia* and the rest to the subgenus *Tripteroides*.

## Subgenus MAORIGOELDIA Edwards.

EDWARDS, F. W., 1930.—*Bull. ent. Res.*, 21: 302.

———, 1932.—In *Wystman's Genera Insectorum, Diptera, Culicidae, Fasc.*, 192: 75.

This subgenus is represented by the single species *T. argyroga* (Walk.), known only from New Zealand.

The palpi are about one-quarter the length of the proboscis in both sexes and have a white ring at the middle. The proboscis is rather stout but longer than the abdomen. There are three or four strong posterior pronotal bristles and the wings are densely clothed with broad scales. Silvery markings are present on the thorax, legs and abdomen. The larval maxilla is unmodified and there are no distinct spines on the metathorax. The lateral comb of the eighth abdominal segment comprises a large number (more than a hundred) of small scales forming a semi-circular patch. The anal papillae are very large and well tracheated.

## TRIPTEROIDES (MAORIGOELDIA) ARGYROGA\* (Walker).

WALKER, F., 1848.—*List Dipt. Brit. Mus.*, 1: 2 (*Culex*).

THEOBALD, F. V., 1901.—*Monogr. Cul.*, 2: 264 (*Uranotaenia?*).

EDWARDS, F. W., 1924.—*Bull. ent. Res.*, 14: 360 (*Rachionotomyia*).

GRAHAM, D. H., 1929.—*Trans. N.Z. Inst.*, 60: 227 (*Rachionotomyia*—includes larval description).

EDWARDS, F. W., 1930.—*Bull. ent. Res.*, 21: 302 (*Rachionotomyia*).

GRAHAM, D. H., 1939.—*Trans. Roy. Soc. N.Z.*, 69: 213 (*Rachionotomyia*).

*Type*: Female in British Museum.

*Type Locality*: New Zealand.

*Synonymy*: *Culex argyropus* Walker 1848. Loc. cit. *Uranotaenia? argyropus* Theobald 1901. Loc. cit. *Rachionotomyia argyropus* Edwards 1924. Loc. cit.

\* Since it is obvious that the intention of authors has been for *Tripteroides* to be regarded as feminine, the change in termination is necessary for agreement with the gender of the genus.

## DISTINCTIVE CHARACTERS.

The head is black with a conspicuous silvery pale blue band bordering the eyes. There are fine dark hairs on the brown pedicels, the clypeus is almost black; the palpi are black with a white band at the middle, they extend beyond the clypeus almost three times its length and are one-fifth the length of the proboscis. The latter is rather stout, black, distinctly longer than the abdomen and slightly longer than the fore femur.

The scutum is dark brown, scantily clothed with dark bronzy narrow scales but with lateral borders of large silvery scales. There are numerous central and dorso-central bristles. The pleura are dark brown, there are two to four posterior pronotal bristles, two spiraculars and one upper sternopleural. The pronotal lobes are white scaled and from them continues a diagonal white scaled line to the base of the mesepimeron. A further patch of broad white scales is present on the upper part of the mesepimeron amongst the subalar hairs.

The femora are dark with silvery white patches at about two-thirds from the base and also at the apex. The tibiae are also tipped with white and the apical tarsi are largely white.

The wings (Plate xii, *a*) are very densely clothed with broad brown scales. The fork cells are very long with the base of the anterior cell slightly nearer the base of the wing than that of the posterior cell.

The male agrees closely with the female, the palpi are 0.225 the length of the proboscis. The genitalia are prominent with the lobes of the ninth tergite (Text-fig. 1) fused and bearing a very large number of dark spines.

The larva has been described by Graham (1929) and would appear to be distinct from all other species for which the larvae are known because of the very numerous lateral comb scales forming an irregular patch.

*Biology*: This species has adopted at least a semi-domestic habitat, having been found breeding in house tanks around bush cottages, but its native habitat has not been disclosed. It has been recorded biting man but is unusual in being nocturnal.

*Distribution*: The exact locality from which the type specimen came is not known. I have seen specimens from Auckland (J. T. Salmon) and Titirangi (S. L. Bisset) but Graham also records it from Nelson, Wellington, Okahune and Waitakere Hills.

Subgenus *TRIPTEROIDES* Giles.

EDWARDS, F. W., 1932.—Culicidae in Wystman's Genera Insectorum, Fasc. 194: 77.

## NITIDIVENTER-GROUP.

As indicated above; this subgenus has been divided by Edwards into two groups, only one of which is known to occur in the Australasian Region. The group which is our direct concern has been called the *nitidiventer*-group and includes all the ornate species with metallic silvery scaling on the thorax and usually on the abdomen as well, and usually with white or silvery femoral markings. All the Australasian species have an azure-blue band at the front of the head and at least partial development of dorso-central bristles. The wing scaling is not very dense but some of the outstanding scales are narrow. The larvae have either a metathoracic spine or both mesothoracic and metathoracic spines and the lateral comb teeth are numerous, long and close-set. The palpi are very short in both sexes (usually no longer than the clypeus), the proboscis is longer than the abdomen and slender, and a posterior pronotal bristle is present.

The subgenus *Tripteroides* is the most widespread within the genus and is found in almost all areas whence the genus itself has been recorded. The *nitidiventer*-group is best represented in the region from Malaya (including the Philippines) eastward.

In the arrangement of the species following below, *T. bimaculipes*, *T. splendens*, *T. littlechildi*, *T. elegans* and *T. alboscuteolata* have in common the dark or even black scutal integument and the rest of the species are distinguished by their largely light orange or yellow scutal integument. Of these, *T. magnesiana*, *T. quasiornata*, *T. nissanensis* and *T. brevipalpis* have the scutal scales brown or black while the remaining two, *T. distigma* and *T. purpurata*, have the scutal scales light greenish-yellow.

## TRIPTEROIDES (TRIPTEROIDES) BIMACULIPES (Theobald).

THEOBALD, F. V., 1905.—*Ann. Mus. Nat. Hung.*, 3: 114 (*Phoniomyia*).

———, 1907.—*Monogr. Cul.*, 4: 660 (*Phoniomyia*).

EDWARDS, F. W., 1924.—*Bull. ent. Res.*, 14: 360 (*Rachionotomyia*).

BRUG, S. L., 1934.—*Ibid.*, 25: 503, 509. (Figures of male genitalia and larval description from unspecified specimens and localities.)

LEE, D. J., 1944.—*Atlas of Mosquito Larvae of the Australasian Region. Australian Military Forces (Restricted)*: 32. (Figures of larva.)

*Types*: Described from three females lodged in National Museum of Hungary, Budapest.

*Type locality*: The type specimens came from two localities. The one listed first is Moroka (altitude about 1,250 metres, just west of Mt. Victoria in Papua—9° 15' S. by 147° 40' E.). The second is Friederich-Wilhelmshaven (now Madang).

*Note*.—It does not appear that the types of this species have ever been re-examined. There is little doubt, however, that the species commonly considered to be *T. bimaculipes*, by Edwards (1924) and others following his definition of the species, has been correctly identified. It is the most widespread ornamented species in New Guinea, a very common species and rather catholic in the selection of breeding habitats, and occurs, in the material examined by me, from sea-level to an altitude of at least 800 metres.

*Synonymy*: *Phoniomyia bimaculipes* Theobald 1905. *Loc. cit.* *Rachionotomyia bimaculipes* Edwards 1924. *Loc. cit.* *Stegomyia ornata* Taylor, F. H., 1914. *Trans. ent. Soc. Lond.*, 1914: 189. *Mimeteomyia ornata* Taylor, F. H., 1916. *Proc. Linn. Soc. N.S.W.*, 41: 565. *Rachionotomyia ornata* Edwards, F. W., 1924. *Bull. ent. Res.*, 14: 361. *Tripteroides ornata* Edwards, F. W., 1932. In Wystman's *Genera Insectorum, Diptera, Culicidae, Fasc. 194*: 78. *T. ornata* (Tayl.) has been included in the synonymy since there seems little doubt that the type is actually *T. bimaculipes*. *T. ornata* came from Milne Bay, a place where *T. bimaculipes* is commonly found, and the description of *T. ornata* fits the present conception of *T. bimaculipes* quite well, the major discrepancies actually being inaccuracies in the description. The type specimen is now badly damaged (head, wings and three legs missing, thorax and abdomen denuded) but sufficient is present to show that the femora have silvery spots and the venter, described as black, is actually pale scaled. Even were *T. ornata* actually a distinct form, it would no longer be possible, either from the description or the type, to recognize it as such. The type is a male, not a female as stated by Taylor (1916).

## DISTINCTIVE CHARACTERS.

The rather dark scutal integument (particularly distally), the broad scaled pronotal lobes and narrow scaled posterior pronota and the silvery scales on the mesepimeron, together with the apical lateral silver bands on the tergites of segments III-VII distinguish this species from its closest allies. The bent, thickened clypeal spines and single dorsal head hairs of the larva, together with the form of the lateral comb, the bifid dorsal siphonal hairs and the two- to three-branched saddle hair serve to distinguish the larva.

## DESCRIPTION.

*Male and Female.*

*Head*: There is a band of azure-blue scales in front covering slightly more than half the depth of the head. The pedicels are brown and the clypeus is dark brown, the palpi are black, shorter than the clypeus and the proboscis is black, very long and slender.

*Thorax*: The scutal integument varies from brown to almost black but is usually dark with a lighter anterior area and clothed with fine narrow black scales. Some broad black scales are also present among the bristles above the wing roots but they are often difficult to discern. The pronotal lobes are yellowish-brown and clothed with broad flat black scales and the posterior pronota are light or yellowish-brown bearing narrow black appressed scales. There are from one to four spiracular bristles, but usually three or four. The pleura are brown, the sternopleuron being largely covered with appressed silver scales and the mesepimeron in specimens from eastern New Guinea is usually about half covered with rounded flat pale scales with silvery reflections. The amount of mesepimeral scaling may be considerably reduced and this is common in specimens from Hollandia. The scutellum has a patch of flat black scales on each lobe.

*Legs*: The legs are black except for the coxae which are yellowish with silvery scales laterally, and the femora which have bluish-white or silvery markings. There is a silvery white spot on the fore and mid femora just beyond the middle and a similar

one preapically. Anteriorly the mid femora have a silvery line from the base to almost midway. On the hind legs this line extends beyond the middle of the femora and there is also a silver preapical spot.

*Wings* (Plate xiii, c): The veins are clothed with small broad dark scales. The base of the lower fork cell is closer to the base of the wing than that of the upper fork cell which itself is about equal to its stem or even up to twice the length of its stem.

*Abdomen*: The abdomen is black dorsally and the venter is golden. There is a large silver lateral area extending from base to apex of tergite II and apical lateral silver bands on tergites III-VII.

*Male Genitalia*: Genitalia examined on New Guinea and northern Queensland specimens conform generally to Brug's figure k (1934, p. 503) rather than figure h. It is unfortunate that localities of the specimens examined by Brug were not stated as it is conceivable that the form represented in figure h may be distinct. (Note also that it is not possible to reconcile his description of the larva of *T. bimaculipes* with the description given by me.) The lobes of the ninth tergite (Text-fig. 8) are narrow, deeply emarginate and with some nine to twelve spines irregularly arranged apically; usually about three of these are longer and stronger than the rest.

#### *Larva.*

The head (Text-fig. 9) is round with strongly bent, thick clypeal spines and all the dorsal hairs single and smooth. The thorax and abdomen are clothed with strongly developed black stellate tufts in striking contrast to the general white body colour. Hair 7 of the mesothorax (Text-fig. 11) is a thickened spine and hair 7 of the metathorax a strongly chitinized stout spine with three unequal branches. The dorsal chaetotaxy of the thorax is illustrated in Text-figure 10. The individual spines of the stellate tufts may end in two or three divergent points. The lateral comb of the eighth abdominal segment comprises some 18-25 strong teeth, of which the more dorsal are the largest, the rest gradually decreasing in size ventrally. The shape of the individual teeth (Text-fig. 13) is irregular, the more dorsal having a rather squarish basal plaque surmounted by a strong pointed spine. Those towards the ventral surface are finely spinose, particularly at the apex. Of the pentad hairs the first is a strongly branched stellate tuft, the second is simple, the third three- to six-branched, the fourth simple and the fifth bifid. The siphon is rather swollen basally and narrow apically, with ten to twelve bifid ventral tufts and about ten pecten spines (Text-fig. 14), and there is an irregular series of dorsal and dorsolateral hairs which are practically always bifid (occasionally a single hair is seen). The saddle of the anal segment is strongly chitinized but not complete ventrally. Its distal margin is invested with a row of spines, the saddle hair is bifid or trifid and the ventral beard is a single four- or five-branched hair. The dorsal subcaudal tuft is usually five-branched and the ventral subcaudal single. The terminal segments are illustrated in Text-figure 12.

*Note.*—Brug describes the larva of this species as having the dorsal hairs of the siphon two- to six-branched. The many larvae examined by me from such widely separated places as Cairns, Milne Bay and Hollandia are remarkably constant in having these hairs bifid only. Other minor details in Brug's description are also at variance with the material before me. It seems likely, then, that the larvae actually described by Brug belong to some other species. Unfortunately he does not indicate from which particular locality his specimens came.

*Biology*: This species bites quite freely throughout the day in scrub and around jungle margins. The larvae are found breeding in hollow logs, treeholes and the like in rain forest and in sago swamps; also in artificial containers such as tin cans but particularly in old coconut shells. The many records before me indicate that such habitats are favoured by this species and this is no doubt associated with its wide distribution and relative commonness.

*Distribution*: Widely distributed throughout New Guinea and in northern Queensland. Records from the Moluccas and New Britain may be valid but I have had no means of checking them. Specimens have been examined from Hollandia, 15.ix.44; 10.x.44; 18.x.44; 1.i.45; 2.i.45:

9.i.45; 15.i.45; 24.i.45; 26.i.45; 6.ii.45; 12.ii.45; 22.ii.45; 23.ii.45; 26.ii.45; 4.iii.45; 20.iii.45; 14.iv.45; Nakasawa, 12.ii.45; Sapari, 26.ii.45; Mt. Dafonsoero, 4.iii.45 (460 metres); Mt. Dafonsoero, 4.iii.45 (770 metres); Doromena, 3.ii.45. (All the above collected by 19th Medical General Laboratory, United States Army.) Milne Bay (Allman, .43; Cameron, .43; Ratcliffe, ix.43; W. V. King, ix.43); Dobodura (Ratcliffe, x.43); Buna (Ratcliffe, xi.43); Tsili Tsili (W. V. King, ix.43); Lae (Ratcliffe, xi.43; D. O. Atherton); Lalapipi (Ratcliffe, ix.43); Bulldog (Atherton, 4.ix.43); Cape Endaiadere (K. G. Clinton, viii.43). Apart from the above localities in New Guinea I have seen specimens from northern Queensland, namely, Wongabel (D. H. Colless, 13.i.45) and Upper Barron (D. H. Colless, 17.i.45), and Miss E. N. Marks has informed me that she has examined larvae from the Blackall Range which were identical with those of this species.

#### TRIPTEROIDES (TRIPTEROIDES) SPLENDENS, n. sp.

*Types*: Holotype female from Dobodura (F. N. Ratcliffe, Oct., 1943), allotype male from Buna (in scrub, July, 1942), and seven female paratypes in the Museum of the Division of Economic Entomology, Council for Scientific and Industrial Research, Canberra, A.C.T. Two female paratypes in Macleay Museum, University of Sydney, two female paratypes in the British Museum and two female paratypes in the National Museum, Washington. All paratypes from Dobodura (F. N. Ratcliffe, Oct., 1943).

*Type Locality*: Dobodura, New Guinea, approx. 7° 30' S. by 148° 15' E.

#### DISTINCTIVE CHARACTERS.

Particularly distinctive of this species are the fairly numerous broad scales of the posterior pronota, the dark and almost bare mesepimeron, the very small silvery spot on abdominal tergite II and pronounced lateral silver triangles on the succeeding segments.

#### DESCRIPTION.

##### *Female.*

*Head*: There is an azure-blue band (appearing black in some lights) in front extending from the eyes almost to the nape. The upright forked scales of the head are entirely black but laterally the head is silver scaled. The palpi are black, a little shorter than the clypeus and the proboscis is very long, slender and black. The pedicels are yellowish-brown.

*Thorax*: The scutum is light brown anteriorly but almost black on the distal two-thirds. It is clothed with fine black scales and dorsocentral bristles are present. The pronotal lobes are clothed with broad black scales mingled with some narrow ones. The posterior pronota are clothed with broad appressed black scales at times mingled with some narrow ones. Except for the light brown anterior and posterior pronota the pleura are dark; the sternopleuron is largely clothed with flat silver scales but the mesepimeron is bare except for a very small patch of silvery scales on the upper third next to the sternopleuron. The scutellum is yellowish-brown with a patch of flat black scales on each lobe and the postnotum is dark brown.

*Legs*: The coxae are yellow with silvery scales laterally. The fore and hind femora have silvery white spots at just beyond the middle and preapically. The mid femora are similar but there is an additional spot on the basal third.

*Wings* (Plate xiii, *b*): The scales are small, dark and broad. The base of the lower fork cell is slightly nearer the base of the wing than that of the upper and the upper fork cell is almost twice the length of its stem.

*Abdomen*: This is black scaled dorsally with a large lateral silver area extending from base to apex of segment II, a very small apical silver spot on III well removed from the lateral margin of the tergite, large basal lateral silver triangles on IV-V, and VI-VII with apical lateral bands expanding at their dorsal ends.

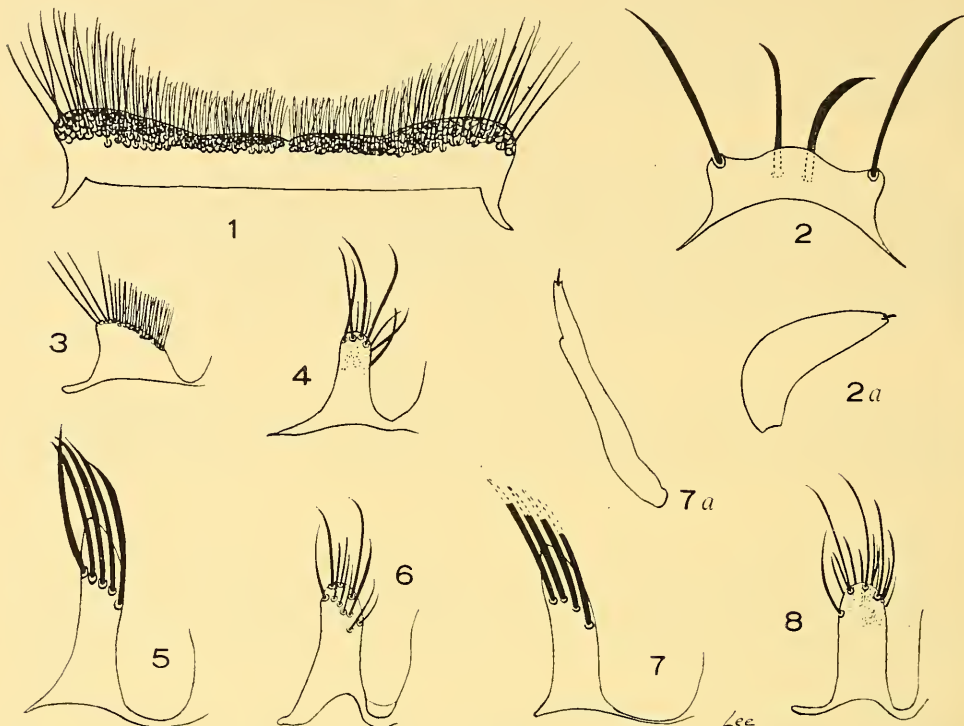
##### *Male.*

The male agrees in all respects with the female. On the genitalia the lobes of the ninth tergite (Text-fig. 7) are long and narrow, straight for most of their length but bluntly pointed apically. The four strong bristles arise from well below the apex. The style (Text-fig. 7a) is modified with a slight spur at about three-quarters from the base. Altogether the genitalia are very close to those of *T. elegans*.

The larval stages have not yet been isolated.

*Biology*: Most of the specimens collected have been taken in scrub, one in a tent and the one from Tsili Tsili was biting at time of capture.

*Distribution*: So far this species has only been found at Dóbodura, Buna, Lae (Ratcliffe, Nov., 43) and Tsili Tsili (W. V. King, Sept., 43).



Text-figs. 1-8.—Terminalia of ornamented species of *Tripteroides*. All figures  $\times 190$  approx.  
 1. Complete ninth tergite of *T. argyrota*. 2. Complete ninth tergite of *T. alboscuteolata*.  
 2a. Style of *T. alboscuteolata*. 3. Lobe of ninth tergite of *T. nissanensis*. 4. Lobe of ninth  
 tergite of *T. quasiornata*. 5. Lobe of ninth tergite of *T. elegans*. 6. Lobe of ninth tergite of  
 species close to *T. brevivalpis* (specimen from Oro Bay, see page 241). 7. Lobe of ninth tergite  
 of *T. splendens*. 7a. Style of *T. splendens*. 8. Lobe of ninth tergite of *T. bimaculipes*.

#### TRIPTEROIDES (TRIPTEROIDES) LITTLECHILDI (Edwards).

EDWARDS, F. W., 1930.—*Bull. ent. Res.*, 21: 544 (*Rachionotomyia*).

*Types*: Holotype female and six other females in British Museum.

*Type Locality*: Tauri R., Tapala, between Yule I. and Port Romilly, Papua. The Tauri R. is also known as the Heate,  $8^{\circ}$  S. by  $146^{\circ}$  E.

*Synonymy*: *Rachionotomyia littlechildi*, Edwards 1930. Loc. cit.

#### DISTINCTIVE CHARACTERS.

*T. littlechildi* is close to both *T. bimaculipes* and *T. splendens*. It is rather darker than both, the scutum except for its anterior margin being shining dark brownish-black and the pleura are similarly dark. The completely bare, shining black mesepimeron distinguishes it from both; the narrow black scales of the posterior pronota are similar to those of *T. bimaculipes* but distinct from *T. splendens*. The abdominal adornment is quite different from that of *T. bimaculipes*, there being the usual large silver lateral area on segment II, there is apparently no silvery marking on III, IV and V have apical lateral silver triangles and VI and VII have apical lateral bands. There are also dull black patches laterally on the tergites rather similar to those of *T. magnesia*. The above description of the abdominal pattern is based on the specimen before me and is much the same as that given by Brug (1934, p. 508) for *T. littlechildi*. It does not conform with the original description given by Edwards (loc. cit.) but as Brug was



almost certainly making his observations on the type series it may be assumed that his notes are accurate, particularly as Edwards remarks that "the leaden-grey markings of the abdomen might perhaps be more silvery in fresh examples". The adornment of the femora on the specimen before me comprises a pale silvery stripe on the basal half and a preapical pale spot, proximally produced into a line on the fore femora; silvery spots on the basal third, about the middle, and preapically on the mid femora, and a basal silvery stripe to just beyond midway and a fairly large subapical spot on the hind femora.

Neither the male nor the larva of this species is yet known.

*Distribution*: Known only from the type locality and Bulldog (on the Lakekamu R.) in Papua (Atherton, viii.43).

#### TRIPTEROIDES (TRIPTEROIDES) ELEGANS Brug.

BRUG, S. L., 1934.—*Bull. ent. Res.*, 25: 507.

*Type*: Described from a single female lodged in the British Museum.

*Type Locality*: Torpedoboot R., south coast of Dutch New Guinea.

#### DISTINCTIVE CHARACTERS.

The scutum is almost black and even the anterior margin is dark reddish-brown. The pronotal lobes are yellowish-brown and clothed with narrow black scales and the posterior pronota are dark brown and almost bare of scales (if any are present they are narrow). There are large areas of silver scales over most of the sternopleura and mesepimera. The scutellum is brown with a patch of flat black scales on each lobe.

In the specimens before me the fore femora have a fine silvery line running from the base to the middle and expanded there to a spot, and another spot is situated preapically. The mid femora are similarly marked and also the hind femora except that the preapical spot is somewhat more conspicuous.

There is a large lateral silver patch extending from base to apex of segment II of the abdomen, a very small apical lateral patch on III (well removed from the lateral margin), large apical lateral patches on segments IV-VI and a smaller one on VII.

#### *Male.*

The male resembles the female in all details. The genitalia are very similar to those of *T. splendens*. The lobes of the ninth tergite (Text-fig. 5) are long and straight but tapering apically and the four or five spines on each lobe are strong, broad, and arise well behind the apex of the lobe. There is also a slight modification of the style, there being a distinct spur at about two-thirds from the base.

The larva of this species has not yet been found.

*Distribution*: The type locality, and I have examined two female and one male specimens from Hollandia (19th Med. Gen. Lab.). These specimens were caught in a light trap by W. V. King.

#### TRIPTEROIDES (TRIPTEROIDES) ALBOSCUTELLATA, n. sp.

*Types*: Holotype male, allotype female (both C. J. Steinhauer, 19th Med. Gen. Lab., 15.xi.44) and two male paratypes (one as above, the other 22.i.45), together with cast larval and pupal skins of a paratype, lodged in the C.S.I.R. Collection. Paratype male (19th Med. Gen. Lab., 22.i.45) and cast larval and pupal skin in National Museum, Washington, U.S.A.

*Type Locality*: Hollandia, Dutch New Guinea.

#### DISTINCTIVE CHARACTERS.

Particularly characteristic of this new species are the narrow scales of the pronotal lobes and the silvery scaled scutellum. The dark scutal integument and the largely silver scaled mesepimeron resemble *T. bimaculipes* but the characters above are distinctive. The male terminalia differ from those of any other ornamented species for which the male is known, although an undivided ninth tergite is also found in *T. argyrota* and occasional unornamented species.

#### DESCRIPTION.

#### *Male.*

*Head*: The head has a band of azure-blue scales in front for over half its depth. The pedicels of the antennae are dull black, the clypeus and palpi black, the latter

exceeding the clypeus by its length. The proboscis is very long, slender and black scaled.

*Thorax*: The scutum is almost black except for the yellowish-brown anterior margin, and is clothed with narrow black scales. The scutellar scales are silvery, particularly when viewed from above; the postnotum is dark brown. The pronotal lobes are yellowish-brown, clothed mainly with narrow black scales, but there may be some broad scales intermingled. The posterior pronota bear few or no scales (if present they are narrow) and a strong bristle. There are about three spiracular bristles. The pleura are largely dark brown but yellow beneath the wing and the sternopleura and mesepimera are largely clothed with silver scales.

*Legs*: The coxae are yellow with silvery scales laterally. On the allotype the fore femora have a golden line on the outer surface becoming silver distally, extending from the base to about three-quarters. There is also a preapical silver patch. The mid femora are similar and the hind femora have a preapical silvery patch which may be indistinct.

*Wings*: The scaling is small but broad, the anterior fork cell is slightly shorter than its stem and the base of the posterior one is nearer to the base of the wing.

*Abdomen*: This is black dorsally with a large lateral silver area on segment II, lateral apical silver patches somewhat expanded dorsally on III and IV, lateral apical patches on V and VI and a variable patch on VII. The venter is golden.

*Genitalia*: The ninth tergite (Text-fig. 2) of this species is very distinctive. It is not divided but comprises a single plate with four prominent spines, the outer pair being longer than the inner pair and nearly as long as the coxite. The basal lobe of the coxite is unusual in having a curved row of about fifteen long and equal thickened hairs and the style is distinctly swollen in the middle (Text-fig. 2a).

#### *Female.*

The female agrees with the male in all essential details.

#### *Larva.*

This differs from *T. bimaculipes* in having head hairs A and f three- to four-branched and the clypeal spine evenly tapering and only moderately curved. Hair 7 of the mesothorax (Text-fig. 22) is simple but unmodified and hair 7 of the metathorax usually has three spines as in *T. bimaculipes* but occasionally has four or five. A striking feature of the eighth abdominal segment is the chitinous lateral plate from which the lateral comb arises. There are some eighteen lateral comb teeth, each bluntly pointed. The third pentad hair is usually nine-branched. On the siphon the pecten is reduced to one to three teeth, there are ten to twelve bifid ventral tufts and the dorsal hairs are bifid. The saddle hair has two to three branches and the ventral beard is a single tuft of eight to twelve branches. The terminal segments are illustrated in Text-figure 23.

*Biology*: The larvae have been found breeding in a log hole in a sago swamp and in treeholes in rain forest.

*Distribution*: Apart from the type locality, I have examined both larval and adult specimens from Lalapipi in Papua.

#### TRIPTEROIDES (TRIPTEROIDES) MAGNESIANA (Edwards).

EDWARDS, F. W., 1924.—*Bull. ent. Res.*, 14: 361 (*Rachionotomyia*).

*Type*: Single female in British Museum.

*Type Locality*: Magnetic Island, north Queensland.

*Synonymy*: *Rachionotomyia magnesiana*, Edwards 1924. Loc. cit.

*Rachionotomyia quasiornata* (nec Taylor) of Edwards 1921. *Bull. ent. Res.*, 12: 80.

#### DISTINCTIVE CHARACTERS.

The thoracic integument is shining yellowish-brown. From similarly coloured species it is distinct in having the scales of the pronotal lobes entirely narrow.

There is a band of deep blue scales, covering more than the anterior half of the head (in some lights, of course, this appears rather grey). The pedicels are yellowish-brown with some fine hairs, the clypeus is dark brown and the palpi black and scarcely longer than the clypeus. The black proboscis is long and slender, considerably longer than the fore femur and longer than the abdomen.

The integument of the scutum, the anterior and posterior pronota are yellowish-brown, that of the pleura, including the mesepimeron, dark brown and largely clothed with flat silver scales. The scales of the pronotal lobes are narrow and black and the posterior pronota may also have a few fine black hair-like scales. The scutal scaling is black, the individual scales being very fine, almost hair-like. Dorsocentral bristles are present on the anterior half of the scutum and there is a pair of prescutellars on either side. There is a single posterior pronotal and two or three spiracular bristles. The scutellum is clothed with flat dark scales but those at the base of the mid lobe may appear silvery in some lights.

There is the usual subapical silver patch on each femur and a variable amount of silver scaling from the base to the middle.

The wings are scaled as in *T. bimaculipes*, the upper fork cell is about equal to its stem and the base of the lower cell is nearer to the base of the wing.

The abdomen is black dorsally with lateral dull black as well as silvery patches; the silvery patch on segment II is large and of even width from base to apex of the segment; those on segments III-VII take the form of apical triangles, the base being on the distal margin of each segment.

Neither the male nor the larva has yet been recorded for this species.

*Biology*: The breeding habitat is unknown but this species has been observed biting man in rain forest in the Northern Territory (A. R. Woodhill).

*Distribution*: Known from northern Queensland and the Northern Territory. Specimens have been examined from Adelaide R. (A. R. Woodhill) and Groote Eylandt (N. B. Tindale) and Cairns (D. H. Colless, 27.iv.44).

#### TRIPTEROIDES (TRIPTEROIDES) QUASIORNATA (Taylor).

TAYLOR, F. H., 1915.—PROC. LINN. SOC. N.S.W., 40: 177 (*Stegomyia*).

EDWARDS, F. W., 1924.—*Bull. ent. Res.*, 14: 361 (*Rachionotomyia*).

*Type*: Female type in School of Public Health and Tropical Medicine, Sydney.

*Type Locality*: Innisfail, north Queensland.

*Synonymy*: *Stegomyia quasiornata*, Taylor 1915. Loc. cit. *Mimeteomyia quasiornata*, Taylor, F. H., 1916. PROC. LINN. SOC. N.S.W., 41: 566. *Rachionotomyia quasiornata*, Edwards 1924. Loc. cit. [*Rachionotomyia quasiornata* (nec Taylor) of Edwards, F. W., 1921. *Bull. ent. Res.*, 12: 80 is really *T. magnesiana*, subsequently described by Edwards 1924 (*Rachionotomyia magnesiana*).]

#### DISTINCTIVE CHARACTERS.

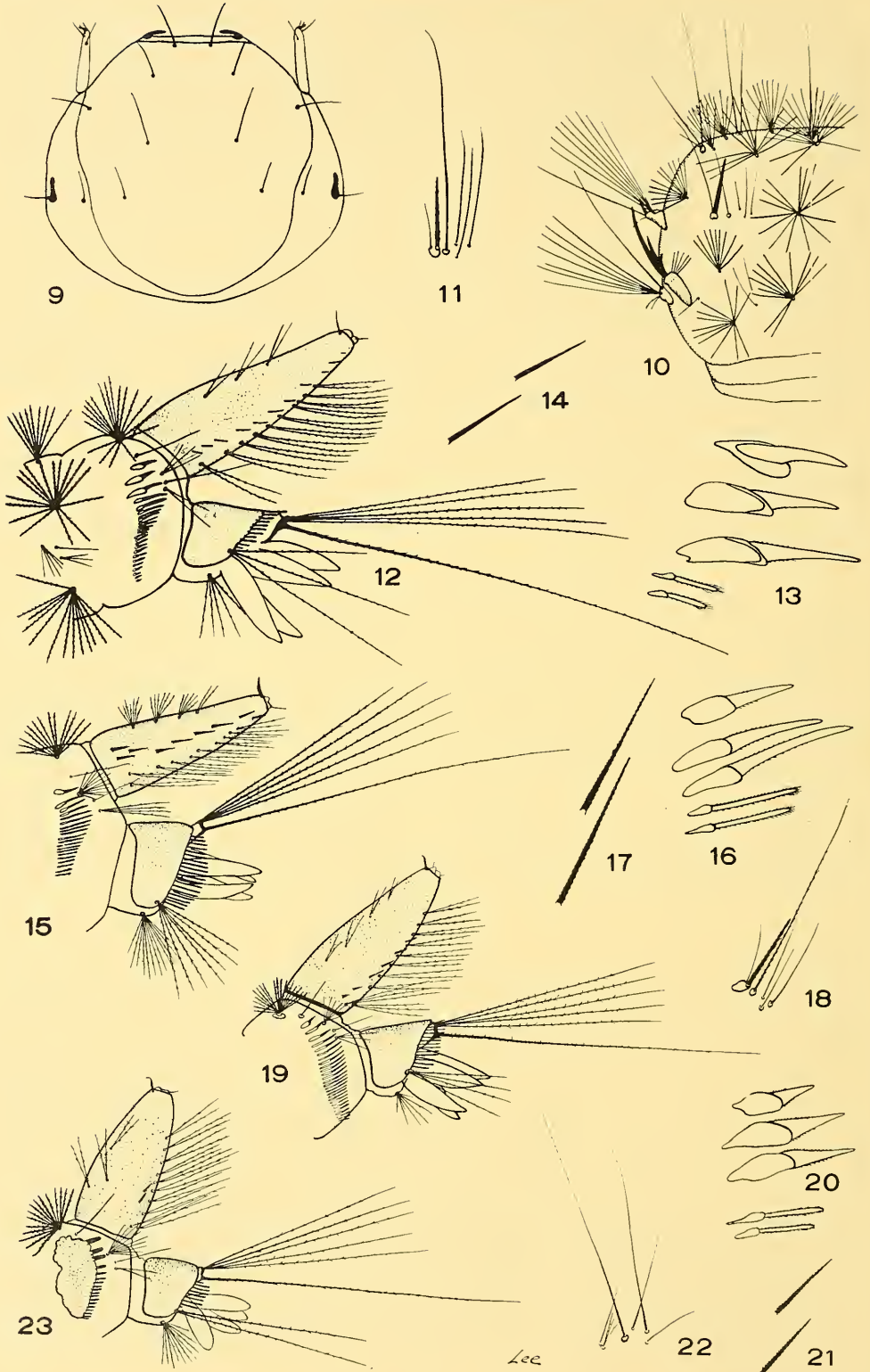
These are discussed for the adult in the corresponding section under *T. nissanensis*. The larva is distinguished by the number of branches in the dorsal hairs of the siphon (usually five to six) and the rather regular lateral comb.

#### DESCRIPTION.

##### *Female.*

*Head*: There is a broad band of brilliant blue scales at the front of the head covering less than half its depth. The pedicels are yellowish, the clypeus dark brown and the palpi black and equal in length to the clypeus. The proboscis is black, slender, very long, decidedly longer than the fore femur.

*Thorax*: The scutal integument is yellowish anteriorly and laterally and indefinitely brownish medially and posteriorly; the scaling is sparse and the individual scales dark and narrow curved with a very few broad, flat, black scales above the wing roots. The scutellar scales are black. The pronotal lobes are clothed with flat black scales but the posterior pronota have some narrow curved black scales and a few small broad, rather triangular black ones. In the type, only one such scale is present on one side but on two specimens (in Macleay Museum, University of Sydney) collected by Taylor from the type locality, and presumably part of the original series, from two to three such scales are present. There is a strong posterior pronotal bristle, two brown spiracular bristles but no upper sternopleural. The central area of the pleura is brown, but the distal half of the sternopleuron and the meron are rather darker. The darker portion of the sternopleuron and the upper part of the mesepimeron are clothed with flat silvery scales. The postnotum is also brown.



*Legs*: All the femora have distinct pale or silvery patches just beyond midway and preapically. There is a narrow pale-scaled line on the outer surface of the fore femora from the base to about midway and there may be some indefinite pale scaling at the base of the mid femora as well.

*Wings*: The wings are scaled as in *T. bimaculipes*, the upper fork cell is about equal to its stem in length and the base of the lower cell is nearer to the base of the wing than that of the upper cell.

*Abdomen*: There is a lateral silvery scaled area covering the depth of tergite II, the succeeding segments have apical lateral silvery bands (not continuous across the dorsum) and the venter is yellowish.

#### Male.

I have seen no males from the type locality but a specimen before me from Mt. Glorious, near Brisbane, 13.ii.45, agrees well with the Innisfail specimens but has six to seven broad scales on the posterior pronota. The genitalia are similar to those of *T. bimaculipes* and the ninth tergite is figured in Text-figure 4.

#### Larva.

The head and thorax are closely similar to *T. bimaculipes*, the clypeal spines, the dorsal head hairs and the modified hairs of the thorax being identical. The lateral comb teeth (Text-fig. 16) are similar but rather more regular in size. There are ten to twelve branches in the third pentad hair and four in the fifth. The pecten spines (Text-fig. 17) are longer than in *T. bimaculipes* and the dorsal hairs of the siphon are two- to seven-branched with the majority with five to six branches. Both the saddle hair and the ventral beard are more strongly branched than in *T. bimaculipes*, the former having seven branches and the latter about twelve. The terminal segments are figured in Text-figure 15. It will be noted that this description does not entirely tally with the figure of the terminal segments of *T. quasiornata* larva published by Hill (1925, Plate vi, fig. 10) and reproduced by Lee (1944, p. 25), but see, however, remarks following description of *T. nissanensis* (page 240).

*Biology*: The larva has been found breeding in treeholes by J. L. Wassell on Mt. Glorious.

*Distribution*: Specimens have been examined from Innisfail (F. H. Taylor) and Mt. Glorious in Queensland.

#### TRIPTEROIDES (TRIPTEROIDES) NISSANENSIS, n. sp.

*Types*: Holotype male, allotype female and morphotype larvae in the C.S.I.R. Collection. Paratype female and morphotype larvae in the Cawthron Institute, Nelson, New Zealand.

*Type Locality*: Nissan in the Green Islands just east of New Ireland, 154° E. by 4° 45' S.

#### DISTINCTIVE CHARACTERS.

The most obviously differential characters are to be found in the form of the ninth tergite of the male and in the larva. However, the female is only likely to be confused with *T. brevivalpis*, with the specimens noted under that species as being probably distinct, and with *T. quasiornata*. From *T. brevivalpis* it is distinct in having the base of the posterior fork cell decidedly nearer the base of the wing, from the specimens from Oro Bay and Biak by the darker central part of the pleura (particularly at the border of the meron) and brown metanotum, but from *T. quasiornata* there does not appear to be any satisfactory way of separating the females. The larva is very similar to that of *T. bimaculipes* but may be distinguished by the simple or non-divergent terminations of the stellate hairs.

Text-figs. 9-23.—Larval structures of ornamented species of *Tripteroides*. 9 and 12 × 45 approx.; 10, 11, 15, 18, 19, 22 and 23 × 40 approx.; 13, 14, 16, 17, 20 and 21 × 100 approx.

9-14. *T. bimaculipes*. 9. Dorsal view of head. 10. Thoracic chaetotaxy (dorsal). 11. Mesothoracic hairs 2-7. 12. Terminal segments. 13. Lateral comb teeth. 14. Pecten spines. 15-17. *T. quasiornata*. 15. Terminal segments. 16. Lateral comb teeth. 17. Pecten spines. 18-21. *T. nissanensis*. 18. Mesothoracic hairs 2-7. 19. Terminal segments. 20. Lateral comb teeth. 21. Pecten spines. 22-23. *T. alboscuteolata*. 22. Mesothoracic hairs 2-7. 23. Terminal segments.

## DESCRIPTION.

*Male.*

*Head:* There is a band of azure-blue in front covering half the depth of the head. The pedicels of the antennae are brown, the palpi black and not as long as the clypeus. The proboscis is black, very long and slender.

*Thorax:* The scutum is shining yellowish-brown and clothed with narrow black scales. The pronotal lobes are yellowish with broad flat black scales and the posterior pronota similarly coloured but bearing narrow curved black scales with a very few broad ones intermingled, and a strong bristle. There are two to three black spiracular bristles. The sternopleura and mesepimera are largely clothed with pale scales with silvery reflections. The pleura are yellowish-brown but the central area is slightly darker. The scutellum has patches of flat black scales on each lobe and the postnotum is dark brown.

*Legs:* The coxae are yellow with silvery scales laterally. The rest of the legs, except for the femoral markings, are black. All the femora have a white patch just beyond the mid point and another one preapically.

*Wings:* The scales are small and broad. The upper fork cell is not quite as long as its stem and the base of the lower fork cell is distinctly nearer the base of the wing than that of the upper cell.

*Abdomen:* This is black dorsally with a large apical lateral silver triangle on segment II and apical lateral silver bands on III to VII. The venter is golden.

*Genitalia:* The lobes of the ninth tergite (Text-fig. 3) are shallow, broad and not deeply indented. Each lobe carries at least twenty setae rather irregularly disposed on the distal margin. The coxites are short being no longer than their width at the base.

*Female.*

This sex is similar in all essentials to the male.

*Larva.*

The head and thorax closely resemble those of *T. bimaculipes*. The clypeal spines are stout and very strongly elbowed at the base, the dorsal head hairs are all simple and the modified hairs of the thorax are similar to those of *T. bimaculipes*. The mesothoracic hairs are shown in Text-figure 18. On the eighth segment the lateral comb is more strongly developed than in *T. bimaculipes*, the combs on each side meeting or almost meeting ventrally. (See Text-fig. 20 for details of lateral comb teeth.) The third pentad hair usually has six branches and the fifth four. The siphon has about seven pecten spines (Text-fig. 21), ten to twelve ventral tufts, of which the two basal ones are trifid, the rest bifid, and the dorsal hairs are all bifid. The saddle hair is three- to four-branched and the ventral tuft comprises some seven branches of varied lengths. Text-figure 19 illustrates the terminal segments. The stellate tufts of the thorax and abdomen have the individual branches terminating in a single or double point, but if the latter then the points are not divergent. In the specimens before me the general colouration of the integument is rather darker than is usual in the genus.

*Biology:* The larvae were found in treeholes by L. J. Dumbleton.

*Distribution:* The type series was collected on Nissan by L. J. Dumbleton. Apart from these specimens, a male and a female in the Macleay Museum, University of Sydney, from Rabaul, New Britain, are rather similar to *T. nissanensis* but the genitalia preparation of the male is rather too distorted for a determination to be made with confidence. These specimens also differ in having the blue band on the head more than half its depth (this is particularly so in the male) and another specimen from Toma, New Britain, agrees with those from Rabaul. These specimens, together with the figure published by Hill (1925—called *T. quastornata*) of a larva from New Britain suggest that a different form exists on this island.

## TRIPTEROIDES (TRIPTEROIDES) BREVIPALPIS Brug.

BRUG, S. L., 1934.—*Bull. ent. Res.*, 25: 508.

*Types:* Described from four males, five females and two larval skins. Type male and female in the British Museum.

*Type Locality:* North coast of Ceram (one of the following places—Warasiwa, Oewin or Hoelng).

## DISTINCTIVE CHARACTERS.

The combination of yellow thoracic integument, with broad scaled pronotal lobes and narrow scaled posterior pronota, the position of the fork cell bases (described as level) together with the abdominal and femoral adornment should serve to distinguish this species from its allies. There are apical silver bands on the abdominal tergites which are only briefly interrupted medially. The femora of the fore legs are described as having a narrow golden line on the apical half and two silvery patches on the basal half, those of the mid leg with two silvery patches apically and a silvery line basally, and those of the hind leg with a preapical silvery patch and a broad silvery stripe about the middle.

According to Brug (loc. cit.) all the dorsal head hairs of the larva are simple and the clypeal spines are stout and bent. Hair 7 of both the mesothorax and metathorax is modified as in *T. bimaculipes* and other species. There are only 14 teeth in the lateral comb of the eighth segment and seven pecten teeth are present on the siphon. The ventral hair tufts are bifid and the dorsal ones simple or bifid. The saddle hair is long and bifid and the ventral tuft five-branched. There is little in the description to differentiate the larva of this species from that of *T. bimaculipes* (as described above). Perhaps the reduced number of lateral comb teeth may be significant.

*Biology*: The larvae were found breeding in bamboo stumps and cut bamboos.

*Distribution*: Only known from Ceram.

*Note*.—Two specimens from Oro Bay (W. V. King) agree in colouration, scaling of the pronotal lobes and posterior pronota, and abdominal adornment with *T. brevipalpis* but differ in other details. The pleural integument is yellowish (instead of dark brown as in *T. brevipalpis*) and the base of the lower fork cell is distinctly nearer the base of the wing than that of the upper cell. Several other specimens from Biak (University of Queensland Collection) agree with the Oro Bay material in all details and I feel these must comprise a quite distinct species. However, since no differences can be noted in the genitalia of the New Guinea specimens (both Biak and Oro Bay) and the brief details and figure of the ninth tergite given by Brug, it would be wise to wait for more adequate material before defining this probably new form. The ninth tergite of a specimen from Oro Bay is illustrated in Text-figure 6.

## TRIPTEROIDES (TRIPTEROIDES) DISTIGMA Edwards.

EDWARDS, F. W., 1925.—*Bull. ent. Res.*, 15: 257 (*Rachionotomyia*).

*Type*: Described from a single female in British Museum.

*Type Locality*: Tulagi on Florida I. in the Solomon Islands.

*Synonymy*: *Rachionotomyia distigma*, Edwards 1925. Loc. cit.

## DISTINCTIVE CHARACTERS.

According to the description *T. distigma* is allied to *T. magnesiana* and others with pale scutal integument. The thoracic integument is mainly orange but the scutal scaling consists of straight hair-like greenish scales with roundish dark brown spots above each wing root clothed with flat deep black scales. The pronotal lobes bear flat black scales and the posterior pronota a few narrow dark ones.

The mid femora have one small obscurely pale spot at the middle in front and the hind femora have a dark dorsal line reaching the base, and on the outer side are pale golden with the tip and a longish area beyond the middle, dark. There are no silvery markings on the tergites and the venter is golden.

*Note*.—Edwards (1925) considered this species to answer the description of *T. ornata* in many respects, but see synonymy of *T. bimaculipes* (page 231).

Neither the male nor the larva has yet been recorded.

*Biology*: Nothing is known of the larval or adult habits of this species.

*Distribution*: So far only known from the type locality.

## TRIPTEROIDES (TRIPTEROIDES) PURPURATA (Edwards).

EDWARDS, F. W., 1921.—*Bull. ent. Res.*, 12: 79 (*Rachionotomyia*).

———, 1924.—*Ibid.*, 14: 361 (*Rachionotomyia*).

BUXTON, P. A., and HOPKINS, G. H., 1927.—Res. in Polynesia: 78 (*Rachionotomyia*). (Includes description of larva.)

*Types*: Described from three females. In British Museum.

*Type Locality*: Suva, Fiji.

*Synonymy*: *Rachionotomyia purpurata*, Edwards 1921. Loc. cit.

#### DISTINCTIVE CHARACTERS.

From the description it appears that this species is closest to those with a light coloured scutum. The scutal integument is dull orange, clothed with greenish scales mingled with some black ones. There are broad flat black scales on both the pronotal lobes and the posterior pronota.

The larva apparently closely resembles *T. bimaculipes* but may be distinguished from this and other species by the chitinous plates from which the lateral combs of the eighth abdominal segment arise being united dorsally; the dorsal portion of the plate is more heavily chitinized than that from which the comb arises. The clypeal spines are not bent.

The male has not yet been described.

*Biology*: This species has been recorded breeding in an old kerosene tin and in tree-holes.

*Distribution*: As far as I am aware, this species is only known from the type locality and Moturiki, a small island nearby. Its larval habitat would suggest a reasonably wide distribution.

#### UNORNAMENTED SPECIES.

All those species lacking metallic silvery scaling on the thorax and abdomen and generally of a drab appearance belong, within the Australasian Region, to either the subgenus *Rachisoura* or *Mimeteomyia*. (There are two possible exceptions, *T. subnudipennis* and *T. concinna* which are discussed elsewhere.) All are best subdivided on the wing scaling which appears to be the most satisfactory character on which to base groupings of species.

#### Subgenus RACHISOURA Theobald.

EDWARDS, F. W., 1932.—Culicidae in Wysteman's Genera Insectorum, Fasc. 194: 76.

This subgenus is, with the exception of the monotypic *Maorigoeldia*, the most restricted of all in its distribution, being confined to New Guinea, islands eastwards to the Solomons and the north of Australia. It is also largely nepenthicolous in habitat but some members of both *Tripterooides* and *Mimeteomyia* have also been found in *Nepenthes*.

The adults all have veins  $R_1$  to  $R_3$  without any narrow outstanding scales although the scales of these veins are broad and fairly large and dense. The larvae characteristically possess enlarged, modified maxillae.

Two groups are recognized below, namely, the *filipes*-group in which there are no narrow outstanding scales on the wing veins and the *vanleeuweni*-group in which narrow outstanding scales are present from vein  $R_{4+5}$  to  $Cu_1$ . No differentiation of the larvae of the two groups is as yet obvious.

#### FILIPES-GROUP.

Apart from the wing scales being all broad there is always a posterior pronotal bristle. The male palpi are variable in length, but no dorsocentral bristles are present. The members of the group are *T. filipes*, *T. papua*, *T. fuliginosa*, *T. latisquama*, *T. longipalpata* and *T. confusa*. The male palpi of the first three are short and those of the last two almost as long as the proboscis.

The male of *T. latisquama* is not known.

#### TRIPTEROIDES (RACHISOURA) FILIPES (Walker).

WALKER, F., 1861.—*Proc. Linn. Soc. Lond.*, 5: 229 (*Culex*).

EDWARDS, F. W., 1924.—*Bull. ent. Res.*, 14: 362 (*Rachionotomyia*).

———, 1927.—*Nova Guinea (Zoologie)*, 15: 354 (*Rachionotomyia*).

NEC PAINE, R. W., and EDWARDS, F. W., 1929.—*Bull. ent. Res.*, 20: 305 (larval description, also reproduced in part in Lee, 1944).



*Types*: Described from a female. In British Museum? As the male in the original series of *T. sylvestris* (which otherwise might be used as allotype for *T. filipes*) is not conspecific with the female (see below), I hereby designate an allotype male and four parahypotype males which are lodged in the C.S.I.R. Museum. Four further parahypotype males are also designated which are lodged two each in the British Museum and the National Museum, Washington. The cast larval and pupal skins of the allotype are also preserved in the C.S.I.R. Slide Collection and these become morphohypotypes.

*Type Locality*: Dorey, New Guinea (Dore or Doreh, in Dutch New Guinea, immediately west of Manokwari—0° 51' S. by 134° 15' E.). The type locality of the allotype and parahypotypes is Hollandia.

*Synonymy*: *Culex filipes* Walker 1861. Loc. cit. *Rachionotomyia filipes* Edwards 1924. Loc. cit. *Rachisoura sylvestris* Theobald, F. V., 1910. Monogr. Cul., 5: 208. *Stegomyia hilli* Taylor, F. H., 1914. Proc. Linn. Soc. N.S.W., 39: 456. *Mimeteomyia hilli* Taylor, F. H., 1916. Ibid., 41: 566.

*Note*.—*T. hilli* has been included in the synonymy of *T. filipes* following Edwards (1924). I have not been able to examine this type but I am informed that it is badly damaged. Some doubt as to the correctness of this synonymy does seem justified as *T. filipes* is a nepenthicolous species, and as far as I have been able to discover *Nepenthes* are absent from the Northern Territory.

I have taken as the basis of the present conception of this species a series of specimens found at Hollandia, a locality rather similarly situated to, and less than 800 kilometres east of, the type locality.

#### DISTINCTIVE CHARACTERS.

This is a typical *Rachisoura* with all the wing scales broad, and short palpi in both sexes. Although best characterized by the form of the ninth tergite of the male this species belongs to a group which is characterized by the light pleural integument. It is readily distinct from *T. latisquama* by the reduced number of prescutellar bristles (no more than two pairs as compared with about seven pairs) and from other species, particularly *T. confusa*, the relatively short hind tibiae (only 75–78% of the mid tibiae) serve to differentiate it. The larva appears adequately characterized by the restricted development of the lateral comb and the enlarged apical tooth of the maxilla, which is distinctly longer than the body of the maxilla.

#### DESCRIPTION.

##### *Female*.

*Head*: The head is clothed with broad greyish-black appressed scales. There are some pale upright scales with fine pale narrow curved scales at the centre of the nape, but laterally the upright scales are black. There is an area of flat pale scales low down at each side of the head but no line of pale scales across the eye margins. The proboscis is a little shorter than the abdomen, equal to the fore femur, rather stout and slightly recurved towards the tip. The palpi are black, 0.2 the length of the proboscis and extending beyond the clypeus for three to four times its length. The clypeus is round and dark brown; the pedicels are dark brown or black, pubescent, with fine greyish hairs. The antennae are black and almost as long as the proboscis.

*Thorax*: The scutum is dark brown, the pleura yellowish-brown. The scales of the scutum are dense, broad, somewhat curved and greyish-black. There are no dorso-central bristles but one pair of prescutellars is present. The pleura are largely clothed with pale yellowish scales, the pronotal lobes with pale scales but there are some brownish ones above and behind; on the posterior pronota the scales are pale below with light brownish ones on the upper part. One posterior pronotal bristle is usually present; there are four or five black spiraculars and one upper sternopleural bristle; the latter is not particularly strong and may be absent. The postnotum is dark brown with a few scarcely noticeable hairs on the distal portion.

*Legs*: The coxae are yellow with pale scales laterally. The rest of the legs are dark scaled except that the femora are pale beneath. The hind tibiae are only from 75% to 78% the length of the mid tibiae.

*Wings* (Plate xii, *b*): All the scales are broad and brown. The upper fork cell is twice the length of its stem and the base of the lower fork cell is usually slightly nearer the base of the wing than that of the upper cell, but they may be level or their relative positions may be reversed.

*Abdomen:* This is black dorsally with strong apical lateral pale triangles (their bases on the distal margins of the segments) on segments II to VII; the line of demarcation between the colours is strongly serrate. The venter is pale and the apex of the abdomen very hairy.

*Male.*

The palpi are one-third the length of the proboscis (not two-thirds as stated by Edwards, 1924, p. 362). The upper fork cell is slightly shorter than in the female (about 1.75 its stem). Two pairs of prescutellar bristles are occasionally present and the abdomen is pale dorsally at the apex of segment VIII.

The lobes of the ninth tergite are long, broad and deeply emarginate and with eight to ten strong spines on the distal margin. (See Text-fig. 24.)

*Larva.*

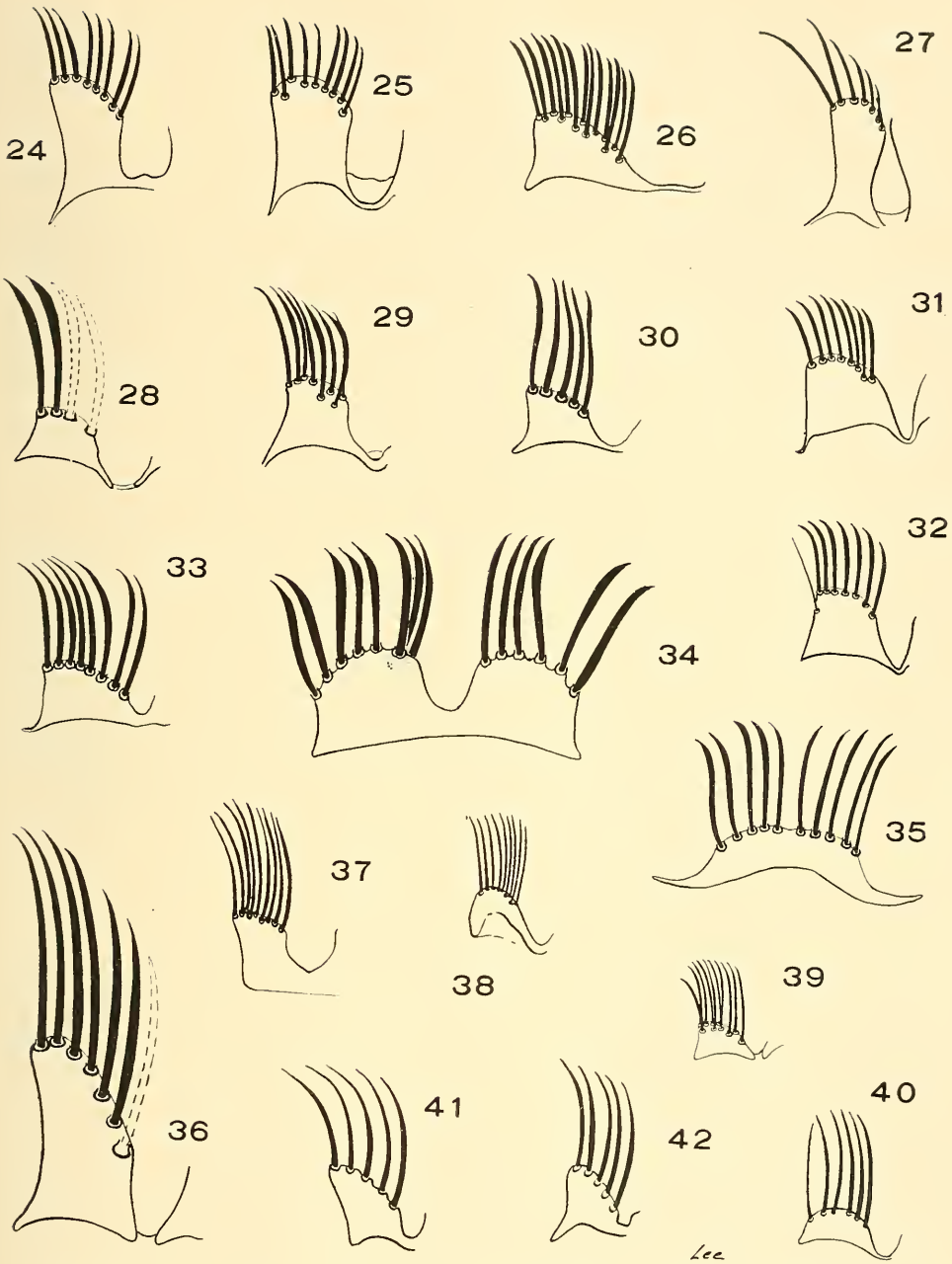
The clypeal spines are rather long and fairly slender. Head hairs A, B and C are usually single, sometimes bifid, C is behind the level of A and longer than the rest; B is well in front of C but in about the same longitudinal plane, d is a little in front of C; e and f are single. The maxillae (Text-fig. 45) have the long apical tooth longer than the body of the maxilla.

Most of the stellate tufts of the thorax and abdomen have two to four branches with strong but sparse pectination and the termination of each spine is nearly always a blunt point but occasionally there are several non-divergent points. There are no modified thoracic spines.

The lateral comb comprises three to five teeth each with a long single or double tooth and basal pectination (Text-fig. 51). The first pentad hair has a chitinous basal plate and about seven strong branches (occasionally reduced to three), the second is single, the third has three or four very small branches, the fourth is single and the fifth has about three very small branches. The siphon is short and tapers rather sharply apically. The ventral hairs of which there are twelve to fourteen have four branches except the basal pair which are about seven-branched. The pecten comprises two to four spines on the distal half of the siphon. Of these, one is situated at the apex and is stronger, stout and slightly curved. The apicodorsal spine is rather long but slender and the ventral siphonal valves have a very long four- or five-branched hair. The dorsal siphonal hairs have three to five branches. The saddle covers the dorsal half of the anal segment and there are only a few teeth (about six) on the distal margin. The saddle hair is single and plumose, the dorsal subcaudal has six finely plumose branches and the ventral tuft is long with six plumose branches.

*Note.*—Brug's (1934) illustration of the ninth tergite of *T. sylvestris*, presumably made from a British Museum specimen (four females and one male comprised the type series described by Theobald; doubtless the male of this series was used), does not agree with the form of the ninth tergite found in the specimens examined by me, which have been correlated with the females by larval characters (through cast skins), by habitat association and by locality association in widely separated areas. It seems most likely that the male figured by Brug actually represents some other species. Furthermore, in Theobald's original description, the length of the male palpi is given as "not quite two-thirds" whereas the male described by me has the palpi only one-third the length of the proboscis. This adds credence to the view that the male specimen in Theobald's type series is not conspecific with the female type and for this reason I have designated a male allohypotype and a number of male parahypotypes. Unfortunately I have not seen any species from Queensland with broad scaled wings in which the male palpi are more than half as long as the proboscis, so cannot suggest what Theobald's male specimen might be, unless of course, it is not a *Rachisoura* at all.

Further, Paine and Edwards' description of the larva of a species from the Solomon Islands (called by them *R. filipes*), although close to *T. filipes*, differs firstly in the larval habitat and in the following larval characters. The maxilla is smaller, the largest tooth shorter and the average number of lateral comb teeth greater (six to nine).



Text-figs. 24-42.—Lobe of ninth tergite of unornamented species of *Tripteroides*. All figures  $\times 190$  approx.

24. *T. filipes*. 25. Specimen mentioned on page 246 as probably *T. filipes*. 26. *T. filipes* sensu Paine and Edwards. 27. *T. confusa*. 28. *T. fuscipleura*. 29. *T. fuliginosa*. 30. *T. pallida*. 31. *T. longipalpata*. 32. Species near *T. longipalpata*, see page 250. 33. *T. bisquamata*. 34. *T. kingi* (both lobes shown). 35. *T. brevirhynchus* (specimen from Jacky Jacky). 36. *T. subobscura*. 37. *T. tasmaniensis*. 38. *T. collessi*. 39. *T. argenteiventris*. 40. *T. caledonica*. 41. *T. aripes*. 42. *T. punctolateralis*.

*Biology:* Adults have been taken biting in the vicinity of Hollandia and all larval collections both from New Guinea and Cape York (north Queensland) have been from pitcher plants, including some from climbing species. The species has been taken up to an altitude of 460 metres but it has been most commonly associated with grassy swamps.

*Distribution:* Specimens have been examined from Hollandia, 23.ii.45; 4.iii.45; 3.iv.45; 13.iv.45 (all 19th Med. Gen. Lab.); Hollandia, 220th M.S.U. (Malaria Survey Unit of the U.S. Army); Dobodura, xii.43 (W. V. King) and Jacky Jacky (Cape York, north Queensland) (Chippendale).

*Note.*—One specimen from Hollandia (23.ii.45, 19th Med. Gen. Lab.—also labelled 718-1 with associated larval and pupal skins) in the C.S.I.R. Collection, closely resembles *T. filipes* but the palpi are 0.4 the length of the proboscis and the hind tibia 94% the length of the mid tibia. The genitalia are similar to those of *T. filipes* but the ninth tergite has nine spines on one lobe (see Text-fig. 25) and twelve on the other. These are somewhat irregularly disposed, particularly laterally. The larva has the stellate tufts with only two to three branches and these are frayed rather than strongly pectinate and the hairs of the ventral siphonal valves have only three branches. It is difficult to say whether this is only an extreme variant of *T. filipes* or a distinct form, but on present evidence I am inclined to regard it as only a variant.

#### TRIPTEROIDES (RACHISOURA) FILIPES sensu Paine and Edwards 1929.

PAINE, R. W., and EDWARDS, F. W., 1929.—*Bull. ent. Res.*, 20: 305 (*Rachionotomyia*).

As pointed out under *T. filipes* the larval description given by these authors does not agree with *T. filipes* from New Guinea. Their specimens from Guadalcanal must belong to an undescribed species. I have before me larvae from Guadalcanal completely agreeing with their description (the maxilla is figured in Text-figure 44) and a male specimen in poor condition from Tenaru (also in the Solomons) has the ninth tergite (see Text-fig. 26) quite distinct from that of *T. filipes* but the palpi are short as in *T. filipes*. Very likely this is the male of the species found by Paine on Guadalcanal breeding in a large wild Aroid and in leaves on the ground. The larvae examined by me were collected by L. J. Dumbleton breeding in *Pandanus* and coconut centres.

#### TRIPTEROIDES (? RACHISOURA) PAPUA Brug.

BRUG, S. L., 1934.—*Bull. ent. Res.*, 25: 505.

*Types:* Type male and female in British Museum.

*Type Locality:* Tanah Merah, Dutch New Guinea.

#### DISTINCTIVE CHARACTERS.

This species is obviously very closely allied to *T. filipes* in nearly all respects. Indeed the resemblance is so close that one might be tempted to place it, tentatively at least, in the synonymy of *T. filipes*. However the following points in the description of *T. papua* make it wise to withhold judgement until further evidence is available. The lengths of the proboscis and palpi, though very close, are not quite as I have found them in *T. filipes*. The scutal scaling may be narrower in *T. papua* and there are fewer spiracular bristles (two to three instead of four to five as in *T. filipes*). Apart from these quite minor differences Brug suggests that the paraprocts may be absent, or if not, are unusual, in the genitalia of this species. I have noticed that the paraproct, in *Tripterooides* generally, has a tendency to fold backwards towards or between the lobes of the ninth tergite. Very likely this is all that has happened to Brug's specimen but while the doubt remains it is better to retain specific status for Brug's name.

The larva of this species has not been described.

*Biology:* A nepenthicolous species (*T. filipes* is also nepenthicolous).

*Distribution:* Only known from the type locality.

#### TRIPTEROIDES (RACHISOURA) FUSCIPLEURA, n. sp.

*Types:* Holotype male, allotype female, two male paratypes and a female paratype in the C.S.I.R. Collection. One paratype of each sex in the National Museum, Washington, and one

male paratype in the British Museum. All except the last one with associated larval and pupal skins.

*Type Locality*: Doromena, near Hollandia, Dutch New Guinea. The female paratype in the C.S.I.R. Collection and the paratypes in the National Museum, Washington, and the British Museum are from Nakasawa, another village in the immediate vicinity of Hollandia.

#### DISTINCTIVE CHARACTERS.

Readily separable from *T. filipes*, *T. confusa* and *T. latisquama* by the dark pleural integument. The very short palpi distinguish it from *T. fuliginosa* (in addition to genitalia characters). The siphon of the larva provides characters which are quite distinct from those of *T. filipes* and its allies. The siphon is longer with the pecten regularly disposed over the basal two-thirds or three-quarters, but it does not extend to the apex as in *T. longipalpata*, nor is the ventral portion of the anal segment hirsute as in the latter species. The enlarged and modified maxilla will of course immediately place it as a member of the subgenus *Rachisoura*.

#### DESCRIPTION.

##### *Male.*

*Head*: This is black scaled with a very few pale flat and upright scales at the middle of the nape at least, or even extending (flat scales) forwards towards the eyes. Laterally the head is pale and there is a very narrow silvery border to the eyes. The pedicels are black and the clypeus dark brown. The proboscis is black, fairly stout, about equal in length to the fore femur and a little shorter than the abdomen. The palpi are black, one-eighth the length of the proboscis (or up to one-sixth in other specimens) and extending beyond the clypeus by somewhat more than twice its length.

*Thorax*: The integument (including the pleura) is dark brown with a rather blackish tint. The scutum is clothed with dense, broad, slightly curved black scales. There are no dorsocentral bristles and at most only one pair of prescutellars. A few pale scales are found at the centre of the anterior promontory, the scutellum is clothed with broad flat dark scales and the postnotum is dark brown and bare. The pleura are densely clothed with white scales. The pronotal lobes are pale scaled below but black scaled above and the posterior pronota are similarly covered, the upper half being clothed with almost black scales. There is one posterior pronotal bristle and two to three spiraculars, but no upper sternopleural.

*Legs*: The coxae are not as yellow as in *T. filipes*, the fore coxae are largely clothed with dark scales (some may be pale dorsally or in some specimens the majority may appear silvery) and the mid and hind coxae are pale scaled. The femora are pale beneath but the rest of the legs are dark. The hind tibiae are about 88% the length of the mid.

*Wings*: All the scales are broad and dark. The upper fork cell is slightly greater than twice its stem and the base of the upper fork cell is slightly nearer the base of the wing than that of the lower cell.

*Abdomen*: This is dark scaled dorsally but the tergites are pale laterally with a straight margin between the colours.

*Genitalia*: The lobes of the ninth tergite (Text-fig. 28) are short but fairly well separated and carry four or five spines which are considerably longer than the lobe. On the holotype four such spines are present on one side and five on the other. One of the paratypes has five such spines on each side.

##### *Female.*

The female agrees closely with the male. The palpi are about one-sixth the length of the proboscis and the latter is equal in length to the fore femur.

##### *Larva.*

The antennal shaft hair is single and situated at about three-quarters from the base. The clypeal spines are rather long and slender, and the head hairs are all simple and rather similar to *T. filipes*, but C is not as long and B is further behind the level of d. The maxillae (Text-fig. 46) have the apical tooth shorter than the body

of the maxilla with three other shorter teeth of decreasing size and a number of rudimentary teeth at the base. The stellate tufts of the thorax and abdomen have three or four branches, each bluntly pointed, smooth, short and pale.

The lateral comb comprises four to six spines, each one having a median long sharply pointed spine with shorter teeth near its base. The first pentad hair has three or four very short pale branches, the second two branches, the third three, the fourth is bifid and the fifth single. All of these are comparatively inconspicuous. The siphon is pale, rather long, narrowing uniformly to the apex, and the pecten comprises five to nine pointed but fringed spines distributed in a row over the basal portion of the siphon. There are fourteen ventral hair tufts each with two to four branches except the basal pair which have six or seven. The dorsal hairs are four- to five-branched and the ventral siphonal valves each have a long bifid hair. The apicodorsal spine is fairly long and slightly hooked apically. The saddle hair is short, single and practically smooth and there are some four to seven small spines on the distal margin. The ventral beard has five to seven plumose branches, the dorsal subcaudal six and the ventral subcaudal one. The anal papillae are not adequately preserved on any of the cast skins before me.

*Biology*: Apart from one specimen bred from a small stump hole all the rest of those before me were bred from the leaf axils of taro.

*Distribution*: Doromena, 25.ii.45; 7.iii.45 (H. Hoogstraal); Nakasawa, 12.ii.45 (W. V. King and D. Johnson).

#### TRIPTEROIDES (RACHISOURA) FULIGINOSA, n. sp.

*Type*: Holotype male (19th Med. Gen. Lab.) in the C.S.I.R. Collection.

*Type Locality*: Hollandia, Dutch New Guinea.

#### DISTINCTIVE CHARACTERS.

The dark pleural integument distinguishes this species from *T. filipes* and its close allies. The palpi are longer than those of *T. fuscipleura*, the head is entirely dark scaled at the nape, the prescutellar bristles are better developed and the ninth tergite is very distinct.

#### DESCRIPTION.

##### *Male.*

*Head*: This is entirely dark scaled except for a very narrow silvery rim to the eyes. The pedicels are dark brown, the clypeus is small, brown, the palpi black and exceeding the clypeus by four times its length and scarcely one-quarter the length of the proboscis. The proboscis is black and slightly longer than the fore femur.

*Thorax*: The integument (including the pleura) is dark brown. The scutal scaling is very dense, broad, curved and black. There are no dorsocentral bristles but three pairs of prescutellars are present. The scutellum is clothed with broad black scales and the postnotum is dark brown. The pronotal lobes are pale scaled below with some black ones above and the posterior pronota are pale scaled on the basal third and black above. There is one posterior pronotal bristle, four black spiraculars and one pale upper sternopleural bristle.

*Legs*: The coxae are pale with pale scales, the fore coxae with a few dark scales anteriorly as well. The rest of the legs are black except that the femora are pale beneath basally.

*Wings*: The scales are all broad. The upper fork cell is three times the length of its stem, and the base of the upper cell is slightly nearer the base of the wing than that of the lower.

*Abdomen*: The tergites are black dorsally but pale laterally with a straight line junction. The venter is pale.

*Genitalia* (Text-fig. 29): The lobes of the ninth tergite are well separated, of medium length and with eight to nine bristles distally.

Neither the female nor the larva of this species is known.

*Biology*: The specimen was taken in flight at the buttress of a large rain-forest tree by H. Hoogstraal.

*Distribution*: Only known from the type locality.

TRIPTEROIDES (RACHISOURA) LATISQUAMA (Edwards).

EDWARDS, F. W., 1927.—Nova Guinea (Zoologie), 15: 354 (*Rachionotomyia*).

*Type*: Holotype female in British Museum.

*Type Locality*: Nassau Mts., Dutch New Guinea (1,500 metres).

*Synonymy*: *Rachionotomyia latisquama*, Edwards 1927. Loc. cit.

DISTINCTIVE CHARACTERS.

*T. latisquama* is very similar to *T. filipes* and *T. confusa* but is readily distinguishable by the greater development of prescutellar bristles (six or seven pairs as contrasted with only one pair in the other two species).

DESCRIPTION.

(Based on a female specimen from Mt. Dafonsero near Hollandia.)

*Female*.

*Head*: This is black scaled with a pale patch at the centre of the nape and a pale rim to the eyes. The pedicels and clypeus are dark brown. The palpi and proboscis are black, the former exceeding the clypeus by about five times its length, and almost one-quarter the length of the proboscis which itself is longer than the fore femur.

*Thorax*: The scutum is dark brown, clothed with broad curved dark brown scales laterally and somewhat narrower ones medially. The pleura are yellowish-brown (as in *T. filipes*). The pronotal lobes are pale scaled below, dark scaled above and the posterior pronota are pale below grading into darker above. There is one posterior pronotal bristle, five to six spiraculars and two to three pale upper sternopleurals. There are no dorsocentrals but six or seven pairs of prescutellars are present. The scutellum is clothed with broad flat black scales and the postnotum is dark brown and bare.

*Legs*: The coxae are pale yellowish-brown with pale scaling. The femora are pale beneath basally only and the hind tibia is 83% the length of the mid.

*Wings*: All wing scales are broad. The upper fork cell is 1.5 times the length of its stem and the base of the lower is a little nearer the base of the wing than that of the upper cell.

*Abdomen*: The tergites are black dorsally with very prominent lateral triangles on the apical half of segments II to VII. The venter is pale scaled.

Neither the male nor the larva of this species is yet known.

*Biology*: The specimen before me was collected biting at an altitude of about 1,400 metres.

*Distribution*: Apart from the type locality this species has been collected on Mt. Dafonsero, near Hollandia, in Dutch New Guinea (3.iii.45, 19th Med. Gen. Lab.).

TRIPTEROIDES (RACHISOURA) LONGIPALPATA, n. sp.

*Types*: Holotype male (19th Med. Gen. Lab., 18.iii.45) together with its cast larval and pupal skin and a morphotype larva in the C.S.I.R. Collection. All were collected by J. P. Toffaleti.

*Type Locality*: Hollandia, Dutch New Guinea.

DISTINCTIVE CHARACTERS.

The long male palpi relate this species to *T. confusa* but the form of the ninth tergite and the maxilla of the larva are striking characters of distinction.

DESCRIPTION.

*Male*.

*Head*: The head is black with a very few pale scales at the middle of the nape and a very narrow silvery rim to the eyes can be seen. The proboscis is equal to the fore femur and the palpi are almost equal in length to the proboscis. The pedicels and the clypeus are brown.

*Thorax:* The scutum is dark brown and clothed with broad curved black scales. There are no dorsocentrals and no prescutellars can be seen. The pronotal lobes are pale below, dusky above and the posterior pronota are similar. There is one posterior pronotal bristle, two to three spiraculars and no upper sternopleural. The pleural integument is a medium brown. The postnotum is brown with a pair of small but distinct fine bristles distally on the mid line.

*Legs:* The coxae are pale yellowish with silvery scales, but the fore coxae are rather darker anteriorly and the scaling may appear dark in some lights. The femora are indefinitely pale beneath to the apex and the hind tibia is about 88% the length of the mid.

*Wings:* All the wing scales are broad but rather pale. The upper fork cell is about 2.5 times the length of its stem and its base is level with that of the lower cell.

*Abdomen:* This is dark scaled above with pale lateral triangles from segment III onwards.

*Genitalia:* The ninth tergite (Text-fig. 31) has the lobes deeply emarginate but not widely separated. They are of medium length with eight or nine distal spines about equal in length to the lobe (see note below).

The female is not yet known.

#### *Larva.*

The clypeal spines are fairly long and slender; head hair A is single and of moderate length, C is single and very long and a little behind the level of A, B is directly in front of C and close to the anterior margin and has six or seven branches, and d is directly behind the clypeal spine and very slightly anterior to B; it also has about six branches. The antennae are rather stout with the shaft hair single and about two-thirds from the base. However the most conspicuous feature of the head is the maxilla which carries an extraordinarily long, rather slender, apically rounded tooth (Text-fig. 47).

Most of the stellate hairs of the abdomen have from two to four branches, each being strongly pectinate. The terminations of each spine often comprise a number of non-divergent points. The integument of the body is invested with minute pale spines.

The lateral comb comprises four to five spines. There appears to be wide variation in the pentad hairs but the specimens before me are obscure in this region. The siphon is of moderate length, evenly tapering with eleven to twelve pecten spines extending in a row for the whole length of the siphon. The basal teeth are minutely fringed. The ventral hairs are trifid except the basal pair (with six or more branches) and in all there are about thirteen ventral tufts. The dorsal hairs are four- to five-branched and the ventral siphonal valve has a long single hair. The saddle covers the dorsal half of the anal segment, the saddle hair is single and plumose and the dorsal subcaudal has five or more plumose branches. The ventral tuft on one side of the cast skin of the holotype has three branches but on the other there are nine. A most conspicuous feature of the anal segment is its ventral surface which is densely clothed with short fine dark spines.

*Biology:* Larvae have been found in cut bamboos in rain forest both at Hollandia and Mt. Dafonsero, and a larva which is indistinguishable from that of *T. longipalpata* was taken from a pitcher plant in mossy forest at an altitude of 1,600 metres.

*Distribution:* The adult is only known from Hollandia but larvae have been identified from Mt. Dafonsero, 19.iv.45, and Mt. Dafonsero at an altitude of 1,600 metres also 19.iv.45 (all collected by 19th Med. Gen. Lab.).

*Note.*—Another specimen from the same collection as the type *T. longipalpata* (date and habitat and numbered 874-2) only differs in having the palpi a little shorter (about three-quarters the proboscis) and the hind tibia longer (about equal to the mid), and the lobes of the ninth tergites similar except that the outermost spine arises well behind the distal margin (Text-fig. 32) and is associated with a larval skin which is very similar in the head hairs, the siphon and even the hirsute area ventrally on the anal segment. However, the extremely long apical spines of the maxillae cannot be



made out, nor can it be decided whether they have been broken off or whether the maxillae are intact. Further collections are required before it can be established whether the specimen before me (now in the C.S.I.R. Collection) is a variant of *T. longipalpata* or a distinct form. It should also be noted that no postnotal hairs can be seen.

TRIPTEROIDES (RACHISOURA) CONFUSA, n. sp.

*Types*: Holotype male, allotype female and a morphotype larva in the C.S.I.R. Collection together with cast larval and pupal skins correlated, but not individually, with the types. Similar cast skins in British Museum and National Museum, Washington. All collected by D. A. C. Cameron, 1943.

*Type Locality*: Milne May, Papua.

DISTINCTIVE CHARACTERS.

The female comes closest to *T. filipes* and *T. latisquama* but the relatively longer hind tibia will distinguish it from the former and the fewer prescutellar bristles from the latter. In most specimens I have seen, the postnotal bristles are rather characteristic, being a pair of small but distinct dark hairs arising close together on the mid line distally on the postnotum, the hairs themselves being widely divergent. The male comes closest to *T. longipalpata* but the lobes of the ninth tergite are quite distinct. The larva is close to *T. filipes* but the trifid ventral beard (instead of six-branched) and the single hair on the ventral siphonal valves are easily discernible differences.

DESCRIPTION.

*Male.*

*Head*: The head is dark scaled with a few pale scales at the middle of the nape and an obscure and narrow pale border to the eyes. The palpi are two-thirds the length of the proboscis which itself is equal in length to the fore femur and not noticeably thickened. The pedicels and the clypeus are yellowish-brown to brown.

*Thorax*: The integument of the scutum is dark brown and that of the pleura yellow-brown. The scales of the scutum are broad, curved and dark brown and appear to be somewhat narrower down the middle. There are no dorsocentrals and only one prescutellar pair appears to be present. The pronotal lobes and the posterior pronota are pale below and somewhat darker above. There is one posterior pronotal bristle (a small second one may also be present), four spiraculars and one strong upper sternopleural. The postnotum is brown with one or two quite strong hairs at the middle towards the distal margin.

*Legs*: The femora are pale beneath to about two-thirds from the base, otherwise the legs are dark. The hind tibia are from 94% to almost equal the mid.

*Wings*: All the wing scales are broad and rather dark. The upper fork cell is a little more than twice the length of its stem and its base is slightly nearer the base of the wing than that of the lower cell.

*Abdomen*: The tergites are black with distinct lateral pale apical triangles.

*Genitalia*: The lobes of the ninth tergite are long, rather narrow, deeply separated and surmounted by seven or eight spines which increase considerably in length from the inner to the outer margin (see Text-fig. 27).

*Female.*

The palpi are barely one-quarter the length of the proboscis, the clypeus is dark brown and the pedicels light brown. The proboscis is equal in length to the fore femur. One pair of prescutellar bristles is present. The femora are pale beneath to the tip and the upper fork cell is twice the length of its stem, the bases of both cells being about level. The abdominal markings are distinctly serrate.

*Larva.*

The clypeal spines are fairly long and slender. Head hair A is single or bifid, B is trifid, directly in front of C but near the anterior margin; C is long, single and well behind the level of A; d is bifid and immediately behind the clypeal spines.

The antennal shaft hair is single and short and about two-thirds from the base. The maxillae are as figured in Text-figure 43. There are no modified hairs on the thorax, the stellate tufts have three to four branches and each branch is finely spinose and simple ended. The lateral comb comprises four to five pointed spines (Text-fig. 55). The first pentad hair has three or four finely and sparsely spinose branches, the second is single and of moderate length, the third has about five very short branches, the fourth is single and the fifth has about four branches, again very short. The siphon is short with three or four pecten teeth (Text-fig. 58), one at the apex and the others also on the distal half. The ventral tufts are nearly all four-branched, but the basal pair has about seven branches. The dorsal hairs are two- to four-branched and the ventral siphonal valves bear a single hair. The anal segment has a small saddle with the saddle hair single and plumose and there are a few spines on the distal margin. The anal papillae are very large and pointed. The terminal segments are figured in Text-figure 56.

*Biology:* Larvae were found in tins and coconut shells in association with *T. bimaculipes*.

*Distribution:* Known with certainty only from the type locality but probably quite widely distributed. This is very likely the species which has usually been called *T. atra*, owing to the paratype of that name seen by Edwards not being conspecific with the type.

*Note.*—A female specimen from Hollandia (10.xi.44, 19th Med. Gen. Lab. No. 270, bred from a treehole in rain forest) closely resembles *T. confusa* even to the rather characteristic postnotal bristles and seems likely to be that species.

#### VANLEEUWENI-GROUP.

Two characters distinguish members of this group from those of the *filipes*-group, namely, the presence of narrow outstanding scales on the posterior wing veins (from  $R_{4+5}$  to  $Cu_1$ ) and the lack of a posterior pronotal bristle. Several of the species have a few broad pale scales on the clypeus (*T. pallida*, *T. kingi* and *T. brevirhynchus*), the rest have no such scales on the clypeus (*T. bisquamata*, *T. vanleeuweni*, *T. pilosa* and *T. simplex*). Two of the species, *T. brevirhynchus* and *T. simplex*, are to be grouped together because the lobes of the ninth tergite are fused and not emarginate.

#### TRIPTEROIDES (RACHISOURA) BISQUAMATA, n. sp.

*Types:* Holotype male, allotype female, three male and one female paratypes in the C.S.I.R. Collection, two male paratypes in the British Museum and one male and one female paratypes in the National Museum, Washington. No cast skins were associated with any of the type series but larval correlations were established through a number of males not used in the type series. Morphotype larvae are lodged in each of the Museums mentioned. The type series was collected by C. J. Steinhauer.

*Type Locality:* Hollandia, Dutch New Guinea.

#### DISTINCTIVE CHARACTERS.

*T. bisquamata* comes very close to *T. vanleeuweni* but is to be distinguished from the latter by the somewhat shorter palpi, fewer spiracular bristles and the lack of prescutellars. The single hind tarsal claw of *T. vanleeuweni* is also an unusual feature and possibly the scutal scales, described as "narrowly-spindle-shaped" may be rather different to those of *T. bisquamata*. The broad scales of the upper part of the posterior pronota are in marked contrast to *T. pilosa*, and the lack of clypeal scales distinguishes it from *T. kingi* and *T. brevirhynchus*, and the dark scaling on the upper part of the posterior pronota from both the last-named and *T. pallida*. The larva has the ventral hair tufts of the siphon much more strongly developed than in the last three species and the form of the lateral comb will distinguish it from *T. filipes* and its allies.

#### DESCRIPTION.

##### *Male.*

*Head:* Dorsally the head is dark scaled with a few pale scales at the centre of the nape, and lateral pale areas. There is a very narrow pale rim to the eyes which is usually obscured by the overhanging broad dark scales. The pedicels are dark brown with fine greyish hairs and scales; the clypeus is dark brown, round and bare. The

palpi and proboscis are black, the former 0.75 the length of the proboscis. The latter is shorter than the abdomen and 0.9 the length of the fore femur.

*Thorax:* The integument of the thorax is dark brown. The scales of the scutum are dense, dark, broad and irregularly spindle-shaped, with some fine pale scales at the anterior margin. There are no dorsocentrals and no prescutellars. The pronotal lobes and the posterior pronota are pale scaled below and dark scaled above. There is no posterior pronotal bristle, two to three spiraculars (occasional specimens have up to five on one side), and no upper sternopleural.

*Legs:* The coxae are yellowish-brown with pale scales on the outer lateral surfaces. The femora are pale scaled beneath at least half-way and even to the tips in some lights, otherwise the legs are dark scaled. The hind tarsal claw is double and the hind tibia is 87% the length of the mid.

*Wings* (Plate xii, c):  $R_1$ ,  $R_2$  and  $R_3$  are broad scaled but the rest of the veins have narrow outstanding scales, particularly distally. The base of the lower fork cell is very slightly nearer the base of the wing than that of the upper cell, the latter being a little more than twice the length of its stem.

*Abdomen:* The dorsum is dark scaled with lateral pale markings; the line of demarcation between the colours is irregular but not markedly serrate. Tergite VIII is pale laterally (visible dorsally) and may be pale dorsally as well. The venter is pale.

*Genitalia:* The lobes of the ninth tergite are broad, not deeply emarginate, and carry six to eight spines (Text-fig. 33).

#### *Female.*

This is similar in most respects to the male but the palpi are only 0.25 the length of the proboscis and exceeding the clypeus by twice its length. The upper fork cell is about three times the length of its stem and the lateral abdominal markings are only slightly irregular.

#### *Larva.*

The clypeal spines are slender, head hair A is long and single, C is similar and well behind the level of A, B is bifid or trifid and near the anterior margin of the head, and d is single or bifid and fairly long. The maxilla is as illustrated in Text-figure 48. The antenna is moderately long with the shaft hair single and situated at about three-quarters from the base.

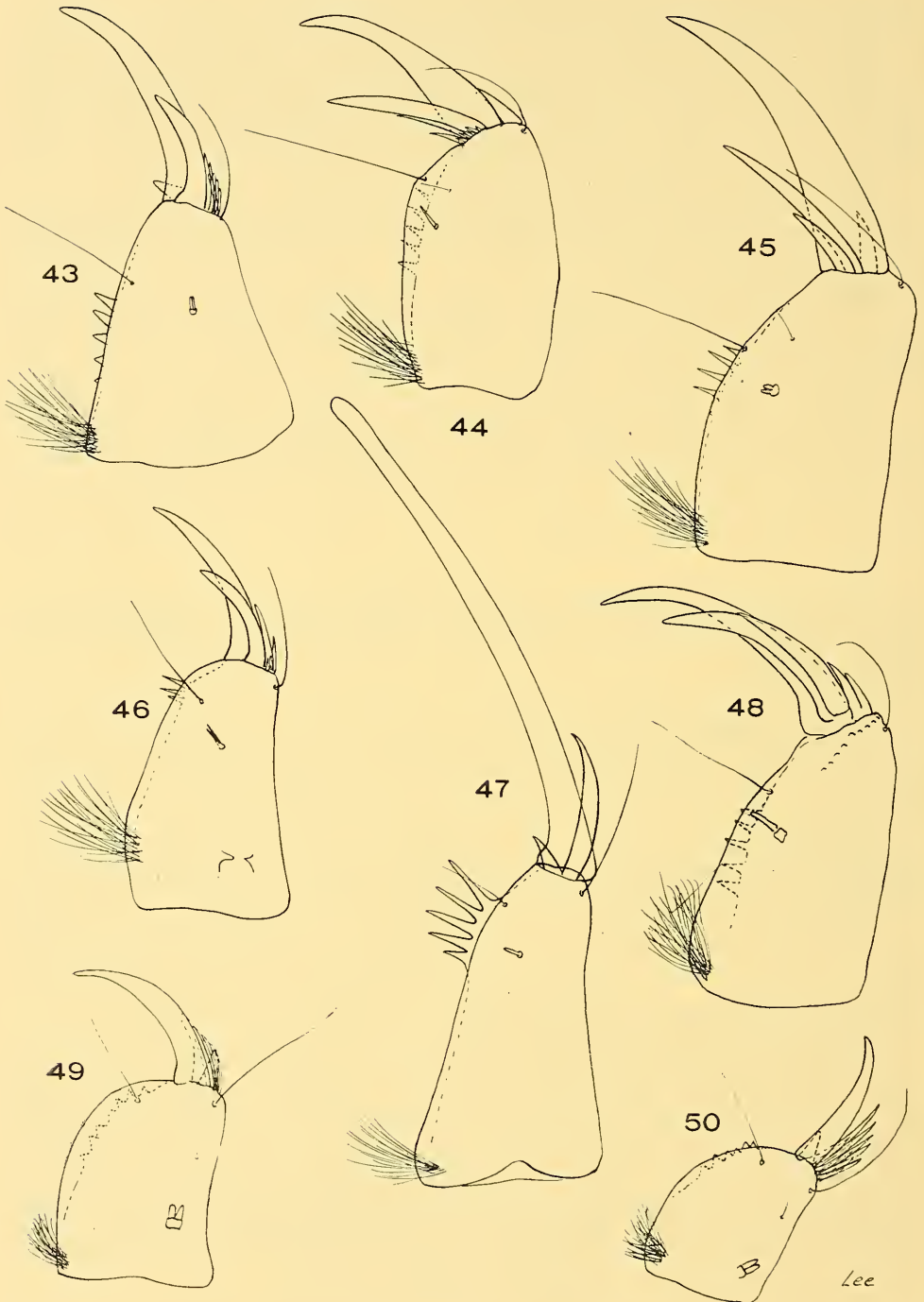
The stellate hairs of the thorax and abdomen have three to seven pectinate branches and each ends in two or more small non-divergent points. The thoracic chaetotaxy is illustrated in Text-figure 52.

The lateral comb of the eighth abdominal segment comprises two to five spines (Text-fig. 54); one or two of these are long pointed teeth, the rest short fringed spines. The first pentad hair is well developed with about eleven pectinate branches, the second is long and single, the third is very short with about ten branches, the fourth is long and single and the fifth similar to the third.

The siphon is moderately long, narrowing apically, the index about three, and the pecten comprises some five to six teeth disposed in a row from near the base to the apex. The sixteen to nineteen ventral hairs are long, bifid or trifid except the basal pair which have some seven branches; all are plumose. The dorsal hairs are well developed with three to four plumose branches. There is a long four-branched hair on each of the ventral siphonal valves. The saddle has distinct spines on its distal margin, the saddle hair is long, single and plumose, the dorsal subcaudal has four or five long plumose branches and the ventral subcaudal is single and plumose. The ventral beard comprises a long six-branched plumose tuft. The anal papillae are long, slender and pointed (see Text-fig. 53 for illustration of terminal segments).

*Biology:* The larvae are found in pitcher plants (including climbing *Nepenthes*), often growing in swampy grassland. Specimens of *Nepenthes* in which this species was found appear to be either *N. mirabilis* or *N. papuana* according to Danser's (1928) revision of this genus.

*Distribution:* A common species in the vicinity of Hollandia but it has not been identified with certainty (due to lack of male specimens) from any other locality.



Text-figs. 43-50.—Larval maxillae of species of *Tripteroides* (*Rachisowa*). All figures  $\times 85$  approx.

43. *T. confusa*. 44. *T. filipes* sensu Paine and Edwards. 45. *T. filipes*. 46. *T. fuscipleura*. 47. *T. longipalpata*. 48. *T. bisquamata*. 49. *T. brevihynchus*. 50. *T. pallida*.

## TRIPTEROIDES (RACHISOURA) VANLEEUEWENI (Edwards).

EDWARDS, F. W., 1927.—Nova Guinea (Zoologie), 15: 355 (*Rachionotomyia*).

*Types*: Described from four females in the British Museum.

*Type Locality*: Rouffaer R. (tributary of Mamberano R.), Dutch New Guinea.

*Synonymy*: *Rachionotomyia vanleeuweni*, Edwards 1927. Loc. cit.

I have not seen this species but apparently it comes close to *T. bisquamata* and may be distinguished in the manner indicated under the description of that species.

To suggest that it is very similar to *T. atripes* is misleading. The lack of dorso-central bristles and the entirely different wing scaling make it immediately distinct from that species.

Neither the male nor the larva has yet been described.

*Biology*: No information is available.

*Distribution*: Only known from the type locality.

## TRIPTEROIDES (RACHISOURA) PILOSA, n. sp.

*Type*: Holotype female in C.S.I.R. Collection. In case the larval skin is located at any time the reference number is 1010-9 (19th Med. Gen. Lab., 20.iv.45).

*Type Locality*: Mt. Dafonsero, near Hollandia, Dutch New Guinea, at an altitude of about 1,250 metres.

## DISTINCTIVE CHARACTERS.

The form of the scaling of the posterior pronota (hair-like above) is a most unusual feature and should prove to be specifically distinctive.

## DESCRIPTION.

*Female.*

*Head*: The head is black scaled with a few pale scales at the centre of the nape. No pale rim around the eyes can be seen. The clypeus is round, bare and dark brown and the pedicels are also dark brown with fine dark hairs on the inner surface. The palpi and proboscis are black, the former exceeding the clypeus by twice its length and being 0.225 the length of the proboscis, which itself is 0.9 the length of the fore femur.

*Thorax*: The integument is dark brown and the scutum is clothed with broad, somewhat curved spindle-shaped dark scales; these are rather narrow laterally and in the middle. There are no dorso-central bristles, three pairs of prescutellars, no posterior pronotal, seven spiraculars and no upper sternopleural. The pronotal lobes are clothed with flat white scales, there are similar scales on the lower part of the posterior pronota, but above, the scales are brownish, curved and hair-like.

*Legs*: The coxae are light brown, with white scales laterally. The femora are pale beneath to the tip but otherwise the legs are dark. The hind tibia is 80% the length of the mid.

*Wings*: The scaling is as in *T. bisquamata*, the base of the upper fork cell is slightly nearer the base of the wing than that of the lower cell and the former is three times the length of its stem.

*Abdomen*: The margin of the lateral pale markings is not distinct but is probably irregular.

The male and the larva are not yet known.

*Biology*: The type was bred from a larva found in a pitcher plant (W. E. Brewer).

*Distribution*: Only known from the type locality.

## TRIPTEROIDES (RACHISOURA) PALLIDA, n. sp.

*Types*: Holotype male, allotype female and one paratype of each sex, together with cast larval and pupal skins of the allotype and male paratype, in the C.S.I.R. Collection. All 19th Med. Gen. Lab., 23.ii.45.

*Type Locality*: Hollandia, Dutch New Guinea.

## DISTINCTIVE CHARACTERS.

Although very similar to *T. brevirhynchus* and *T. kingi*, both the male and the larva are quite distinct. The female palpi are rather longer than in *T. brevirhynchus* and the general colouration not such a pronounced rusty brown, nor again are the abdominal markings so obviously serrate. *T. kingi* has the upper border of the posterior

pronota distinctly brown scaled. The differentiation of the larva is discussed under *T. kingi*.

## DESCRIPTION.

*Male.*

*Head:* Dorsally the head is dark scaled with no pale scaling on the nape but a pale rim to the eyes is present. The pedicels and clypeus are dark brown, the palpi and proboscis are black. The palpi are 0.22 the length of the proboscis which itself is 0.9 the length of the fore femur. Several large pale scales are present on the clypeus.

*Thorax:* The integument is dark brown, the scutal scales are broad and curved though somewhat narrower along the midline. There are no dorsocentral bristles and three pairs of prescutellars. The pronotal lobes and the posterior pronota are pale scaled, there is neither posterior pronotal nor upper sternopleural bristle, but there are five to six spiraculars.

*Legs:* The coxae are light brown with pale scales laterally. The femora are pale beneath to the tip but otherwise the legs are dark scaled. The hind tibia is 80% the length of the mid.

*Wings:* The scaling is as in *T. bisquamata*. The base of the upper fork cell is slightly nearer the base of the wing than that of the lower cell and the former is about 2.3 times the length of its stem.

*Abdomen:* Dorsally the abdomen is dark scaled with the lateral pale areas having an indefinitely serrate margin.

*Genitalia:* The lobes of the ninth tergite are short, well divided, with five long spines distally (Text-fig. 30).

*Female.*

The female is similar to the male in most respects. However, no scales could be observed on the clypeus on most specimens examined, and it is thought that they are seldom present since no pits at which scales might have been attached could be seen. The palpi barely exceed the clypeus by twice its length. The proboscis is 0.8 to 0.9 times the length of the fore femur. The lateral markings of the abdomen are straight to segment IV then indefinitely serrate to the apex. The upper fork cell is about three times the length of its stem.

*Larva.*

The antennal shaft hair is single and arises at three-quarters from the base; head hair A is single, C is similar and behind the level of A, and B and d are bifurcate at about half their length and situated near the anterior margin. The maxilla is as figured in Text-figure 50.

The stellate hairs have from three to seven branches but are only minutely frayed. The lateral comb is reduced to a single long smooth spine. The first pentad hair has about five strong branches, the second is fairly long and single, the third very short with about five branches, the fourth is single and the fifth bifid and fairly long.

The siphon is very short with the siphonal index barely more than one. There are four or five pecten spines and six ventral hair tufts of which all are bifid or the basal two may be trifid. The dorsal hairs (of which there are two pairs) are bifid. There are minute spines distally on the saddle and the saddle hair has three long plumose branches. The dorsal subcaudal tuft has three finely plumose branches and the ventral subcaudal one. The ventral beard comprises a long six-branched hair.

*Biology:* The type series was bred from larvae collected in climbing pitcher plants by W. V. King. Other adult females were taken biting in sago swamps and rain forest.

*Distribution:* Hollandia, 23.ii.45 (10 specimens); Nakasawa (2 specimens); all collected by 19th Med. Gen. Lab. The species has not yet been recorded elsewhere.

## TRIPTEROIDES (RACHISOURA) KINGI, n. sp.

*Types:* Holotype male, allotype female, two female paratypes together with the cast larval and pupal skins of the holotype in the C.S.I.R. Collection. All collected by 19th Med. Gen. Lab. (W. E. Brewer).

*Type Locality:* Mt. Dafonsoero, Dutch New Guinea (1,230 to 1,450 metres).

## DISTINCTIVE CHARACTERS.

A very dark species closely related to *T. pallida* and *T. brevirhynchus*. The male genitalia are distinct from both but the larva is very similar. In *T. pallida* there are only two pairs of dorsal hairs on the siphon (instead of four to five), and no more than six ventral hair tufts (instead of six to nine). Again, the siphonal index of *T. pallida* is distinctly less than that of *T. brevirhynchus*. *T. kingi* probably comes closest to *T. brevirhynchus* but its siphonal index tends to be less and the saddle hair has two (rarely three on one side only) branches as compared with three to four in *T. brevirhynchus*. Further material of the latter is required before more exact means of differentiation can be proposed. The female is darker than both *T. pallida* and *T. brevirhynchus* but particularly darker than the latter, and in contrast to both, it has the scales on the upper part of the posterior pronota distinctly brown.

## DESCRIPTION.

*Male.*

*Head:* The head is black with a silver rim and there is a small pale patch at the middle of the nape best visible from in front. The pedicels are black with fine dark hairs on the inner surface and the clypeus is very dark brown with some three to five large pale scales. The palpi and proboscis are black; the former are a little more than one-quarter the length of the latter, which is distinctly longer than the fore femur (9:8).

*Thorax:* The integument is dark brown, rather blackish, particularly on the exposed parts of the pleura. The scutum is clothed with rather broad spindle-shaped scales, the pronotal lobes with pale scales, and the posterior pronota are pale scaled below and brown scaled above. There are no dorsocentrals but about three pairs of prescutellar bristles are present. There is no posterior pronotal nor upper sternopleural bristle but there are at least four spiraculars.

*Legs:* The coxae are brown with pale scaling laterally. The femora are pale beneath to about half-way and the hind tibia is about 82% the length of the mid.

*Wings:* The scaling is as in *T. bisquamata*, the base of the upper fork cell is nearer the base of the wing than that of the lower cell and the former is three times the length of its stem.

*Abdomen:* This is dark dorsally with lateral pale markings which are serrate on the distal segments (IV onwards).

*Genitalia:* The lobes of the ninth tergite are broad, emarginate, with six to eight strong spines distally (see Text-fig. 34; both lobes are figured since there is some variation on either side).

*Female.*

This resembles the male in most respects except that the palpi are only one-sixth the length of the proboscis and extend beyond the clypeus a little more than twice its length and the proboscis is only 0.9 the length of the fore femur. There are five or six spiracular bristles on the allotype but one of the paratypes has up to eleven.

*Larva.*

Head hair A is long and single, C is behind the level of A, single but not very long, B and d are near the anterior margin of the head and both bifurcate at some distance from the base. The antennal shaft hair is rather long, usually bifid and situated beyond three-quarters from the base.

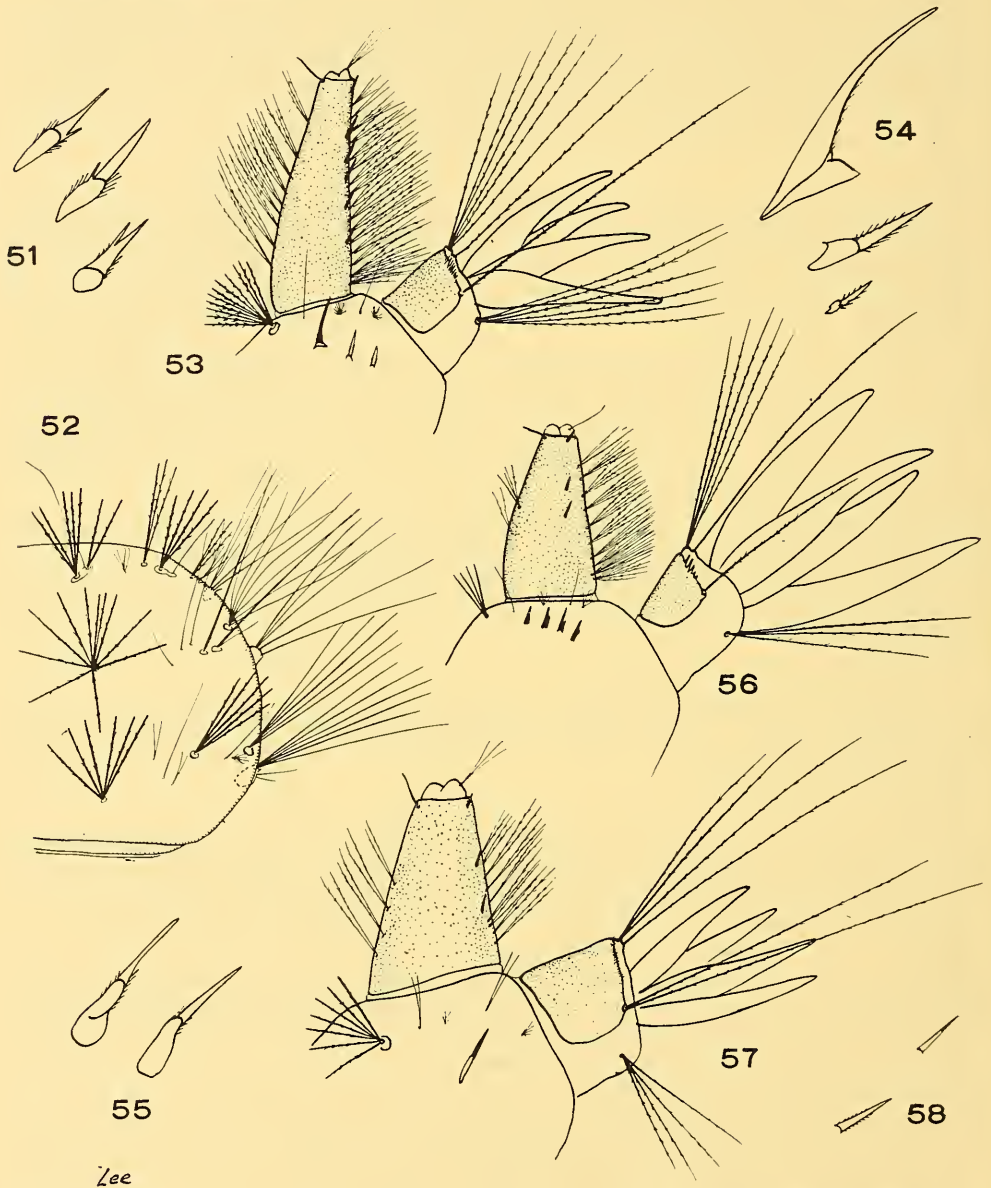
The stellate hairs have from two to five branches (usually four) with very fine fraying and simple points.

The lateral comb comprises a single large pointed spine. The first pentad hair has about seven strong branches, the second is fairly long and bifid, the third very short with five or more branches, the fourth is similar to the second and the fifth to the third. The siphon is short with index about 1.5, the pecten comprises two to four pointed teeth situated on the distal two-thirds, with one or two spines very close to the apex. The ventral hairs (of which about nine are present) are bifid and the dorsal hairs (of which there are eight or nine) are also bifid. The saddle is only finely spinose distally and the saddle hair has two long plumose branches. The dorsal

subcaudal has three plumose branches, the ventral subcaudal one and the ventral beard four. The anal papillae are long, narrow and pointed. The terminal segments are illustrated in Text-figure 57.

*Biology:* Larvae have been taken in pitcher plants and adult females biting during the day but all collections have been from considerable altitudes.

*Distribution:* All specimens examined have been from Mt. Dafonsoero at altitudes ranging from 925 to 1,450 metres.



Text-figs. 51-58.—Larval structures of unornamented species of *Tripteroides* (*Rachisoura*). 51, 54, 55 and 58  $\times 100$  approx.; 52, 53, 56 and 57  $\times 40$  approx.

51. Lateral comb scales of *T. filipes*. 52. Thoracic chaetotaxy (dorsal) of *T. bisquamata*. 53. Terminal segments of *T. bisquamata*. 54. Lateral comb scales of *T. bisquamata*. 55. Lateral comb scales of *T. confusa*. 56. Terminal segments of *T. confusa*. 57. Terminal segments of *T. kingi*. 58. Pecten spines of *T. confusa*.

Zee



## TRIPTEROIDES (RACHISOURA) BREVIRHYNCHUS Brug.

BRUG, S. L., 1934.—*Bull. ent. Res.*, 25: 503.

*Types*: Type male and female in British Museum. Cotype male and female were deposited in Institute voor Tropische Hygiene, Amsterdam.

*Type Locality*: Tanah Merah, Dutch New Guinea.

## DISTINCTIVE CHARACTERS.

The wing scaling immediately relates this species to the *vanleeuweni*-group. It is closest to *T. pallida* but it is generally a rather brighter brown than that species and the abdominal markings are distinctly serrate. The larva is very close to that of *T. kingi* but may be distinguished as indicated under the description of that species.

## DESCRIPTION.

(Based on northern Queensland specimens.)

*Male.*

*Head*: The head is brown with a distinct pale patch at the centre or generally pale greyish-brown and there is a distinct pale scaled margin to the eyes. The pedicels and clypeus are rather light brown, the latter with a very few large pale scales. The palpi are 0.2 the length of the proboscis which itself is rather stout and about 0.8 the length of the fore femur.

*Thorax*: The integument is brown and the scutal scaling mixed broad and narrow brownish spindle-shaped scales. The pronotal lobes and the posterior pronota are clothed with flat whitish scales and some rather greyish ones dorsally on the latter. There are no dorsocentral bristles, two strong prescutellars, no posterior pronotal or upper sternopleural and three or four spiraculars.

*Legs*: The coxae are light brown with pale scaling; the femora are pale beneath to the tip.

*Wings*: The wing scaling is as in *T. bisquamata*. The upper fork cell is distinctly nearer the base of the wing than that of the lower cell and the former is three times the length of its stem.

*Abdomen*: This is brown scaled dorsally with pale apical lateral triangles.

*Genitalia*: The ninth tergite (Text-fig. 35) is undivided, with ten comparatively long spines distally (eight to twelve are mentioned in the original description).

*Female.*

This is similar to the male in most details. The pedicels and clypeus are somewhat darker brown and the palpi exceed the clypeus by twice its length. The hind tibia is 78% the length of the mid.

*Larva.*

Only fragmentary material from northern Queensland is at present available but there is general agreement with the description and figures published by Brug. The maxilla is rather small (see Text-fig. 49).

*Biology*: This is a nepenthicolous species. Those from northern Queensland were collected in *N. Kennedyi* (ana) (? synonym of *N. mirabilis*).

*Distribution*: Known from the type locality (Tanah Merah) and Endeavour Strait, north Queensland (F. Chippendale). It is interesting to note that this adds a further species to the list of those common to the southern part of Dutch New Guinea and north Australia.

## TRIPTEROIDES (? RACHISOURA) SIMPLEX Brug.

BRUG, S. L., 1934.—*Bull. ent. Res.*, 25: 507.

*Types*: Described from a single male. In British Museum.

*Type Locality*: Tanah Merah, Upper Digoel R., Dutch New Guinea.

## DISTINCTIVE CHARACTERS.

The description of this species is scarcely adequate for it to be placed in its proper group. Brug indicates that it is very similar to *T. brevirhynchus*, and as in that species, the ninth tergite is undivided. An examination of the wing is necessary before it can definitely be placed in *Rachisoura* but this supposition is not in conflict with the details

given in the description. (It will be seen later that species in which the wing scales are all narrow rarely lack a posterior pronotal bristle). Examination of the terminalia would be necessary to recognize this species although there is still the possibility of confusion with *T. brevirhynchus*. The palpi of the latter are somewhat longer, extending beyond the clypeus for twice its length instead of only a little more than the length of the clypeus as in *T. simplex*.

Neither the female nor the larva of this species has yet been described.

*Biology*: A nepenthicolous species.

*Distribution*: Only known from the type locality.

#### SPECIES NOT PLACED IN ANY SUBGENUS.

The following two species must at present be treated with the unornamented species but their subgeneric position is still in doubt, since neither the male nor the larva of either is yet known. Nevertheless the two are certainly closely related since the scaling of the wings is distinctive. The wing scales generally are rather small, although broad, and there are sparse narrow outstanding scales at the terminations of the posterior veins.

#### TRIPTEROIDES CONCINNA, n. sp.

*Types*: Holotype female and one paratype female in the C.S.I.R. Collection. Both 19th Med. Gen. Lab., 2.iii.45 (W. R. Fullem and H. W. Cook).

*Type locality*: Mt. Dafonsoero, near Hollandia, Dutch New Guinea, at an altitude of 1,400 metres.

#### DISTINCTIVE CHARACTERS.

The small broad scales on the upper surface of the wings and narrow scales below on veins  $R_{4+5}$  onwards will separate this species from all other unornamented ones except *T. subnudipennis*. From the latter the entirely dark upright forked scales will be distinctive.

#### DESCRIPTION.

##### *Female.*

*Head*: The scales of the head are entirely dark dorsally, silvery white laterally and with a very narrow silvery rim to the eyes. The pedicels and clypeus are brown, the latter bare. The palpi exceed the clypeus by at least three times the length of the latter and are 0.2 the length of the proboscis. The proboscis is rather long, equal to the fore femur and at least as long as the abdomen.

*Thorax*: The scutal integument is dark brown, the pleural integument brown. The scutal scaling is dense, dark, rather narrow medially but with broad curved spindle-shaped scales laterally and distally. There are no dorsocentrals but four pairs of prescutellars are present. The pronotal lobes and the posterior pronota are pale scaled below and light brownish above but there is no marked contrast in the colours. There is a single posterior pronotal bristle, three to four spiraculars but no upper sternopleural. The pleural scales cover practically all but the anterior half of the sternopleura and are silvery white. The scutellum is clothed with dark flat scales and the postnotum is dark brown.

*Legs*: The coxae are pale with silvery white scales laterally. The rest of the legs are dark scaled but the femora are pale beneath to the tip. The hind tibia is about 95% the length of the mid.

*Wings* (Plate xii, a): The scaling is small but broad on the upper surface, but there are narrow outstanding scales below distally on veins  $R_{4+5}$ ,  $M_1$ ,  $M_2$ ,  $M_{3+4}$  and  $Cu_1$ . The base of the upper fork cell is decidedly nearer the base of the wing than that of the lower cell. The upper cell is almost three times the length of its stem.

*Abdomen*: This is dark scaled dorsally and yellowish ventrally. The lateral yellowish scaled areas of the tergites have an indefinitely straight margin.

Both the male and the larva are as yet unknown.

*Biology*: All specimens examined were caught biting at an elevation of 1,400 metres.

*Distribution*: Only known from the type locality.

## TRIPTEROIDES SUBNUDIPENNIS (Edwards).

EDWARDS, F. W., 1927.—Nova Guinea (Zoologie), 15: 355 (*Rachionomyia*).

*Type*: A single female in the British Museum.

*Type Locality*: Nassau Mts., Dutch New Guinea (2,400 metres?—stated as 2,400 feet but as all other altitudes cited in this paper are in metres it seems likely that metres was intended).

*Synonymy*: *Rachionomyia subnudipennis*, Edwards 1927. Loc. cit.

## DISTINCTIVE CHARACTERS.

From the description it is difficult to place this species. Edwards relates it to *T. vanleeuweni* but states that the wings are much more scantily scaled, the scales smaller and narrower. To my mind this relates it to *T. concinna* and it seems likely that the two comprise a group of their own. The presence of a posterior pronotal bristle is a further indication that it is not really closely related to *T. vanleeuweni*. However, it should not be difficult to recognize this species because all the upright scales of the head are yellow. Other details are that the proboscis is as long as the abdomen and the palpi are less than one-quarter the length of the proboscis. There is one small yellow posterior pronotal bristle, about three yellow spiracular bristles and two or three pairs of prescutellars. The scutal scales are moderately broad and slightly curved and the sides of the abdominal tergites are broadly whitish, the separation of the colours being straight. The base of the upper fork cell is very distinctly nearer the base of the wing than that of the lower cell.

Neither the male nor the larva of this species has been described.

*Biology*: No information is available.

*Distribution*: Only known from the type locality.

## Subgenus MIMETEOMYIA Theobald.

EDWARDS, F. W., 1932.—Culicidae in Wysteman's Genera Insectorum, Fasc. 194: 76.

The members of this subgenus are all unornamented species which may be distinguished from all the preceding species on the scaling of the wings, there being fairly dense, almost linear outstanding scales on all the wing veins.

## ATRIPES-GROUP.

The members of this group have the proboscis shorter than the abdomen, the male palpi almost as long as the proboscis and the female palpi about one-sixth the length of the proboscis. There are modified spines on both the mesothorax and metathorax of the larva and the lateral comb arises from a lateral chitinous plate. All the species are closely similar and require care in their differentiation. One species, *T. digoelensis*, is tentatively included in this group but its description is not adequate for it to be placed with any certainty.

## TRIPTEROIDES (MIMETEOMYIA) ATRIPES (Skuse).

SKUSE, F. A., 1899.—Proc. Linn. Soc. N.S.W., 13: 1750 (*Culex*).

THEOBALD, F. V., 1901.—Monogr. Cul., 2: 58 (*Culex*).

TAYLOR, F. H., 1914.—Proc. Linn. Soc. N.S.W., 38: 750 (*Scutomyia*).

———, 1919.—Ibid., 43: 829 (*Mimeteomyia*).

EDWARDS, F. W., 1924.—Bull. ent. Res., 14: 362 (*Rachionomyia*).

COOLING, L., 1924.—Commonw. Aust. Dept. Hlth. Serv. Publ. (Trop. Div.), 8: 15 (*Rachionomyia*—includes larval description).

EDWARDS, F. W., 1927.—Nova Guinea (Zoologie), 15: 352 (*Rachionomyia*).

LEE, D. J., 1944.—Atlas of Mosquito Larvae of the Australasian Region. Australian Military Forces (Restricted): 19 (larval description).

*Type*: Type female in Macleay Museum, University of Sydney.

*Type Locality*: Knapsack Gully, Blue Mountains, N.S.W. (Homebush is the locality listed first by Skuse but this is not the type specimen.) It should also be noted that the specimen mentioned by Skuse from Mossman's Bay—that is, Mosman—is not *T. atripes* but is actually a specimen of *T. tasmaniensis*.

*Synonymy*: *Culex atripes*, Skuse 1899. Loc. cit. *Culex atripes*, Theobald 1901. Loc. cit. *Scutomyia atripes*, Taylor 1914. Loc. cit. *Mimeteomyia atripes*, Taylor 1919. Loc. cit. *Rachionomyia atripes*, Edwards 1924. Loc. cit. *Mimeteomyia apicotriangulata* Theobald, F. V., 1910. Monogr. Cul., 5: 211—Single female type in British Museum from Kuranda, north Queensland.

## DISTINCTIVE CHARACTERS.

The outstanding scales of the wing are all narrow and the proboscis short (it is shorter than the abdomen but usually a little longer than the fore femur; in spite of this, the proboscis is not likely to be considered long since the femur itself is also short). The black scaled head will distinguish it from the species most resembling it, namely *T. punctolateralis* and the bronzy scaled scutum from *T. solomonis*. In the larva the presence of both mesothoracic and metathoracic spines together with the lateral comb arising partly from a chitinous plate and the stout divided antennal shaft hair will serve to distinguish it from all but *T. solomonis* (but see below under *T. solomonis* for further remarks concerning that form). The bluntly rounded points of the lateral comb spines arising from the lateral plate are also important.

## DESCRIPTION.

*Female.*

*Head:* The head is black scaled with a narrow but conspicuous silvery border to the eyes. The proboscis is shorter than the abdomen and in the holotype it is equal in length to the fore femur but in most other specimens I have examined it is slightly longer. The female palpi are one-sixth the length of the proboscis and those of the male are equal in length to the proboscis.

*Thorax:* The thoracic integument is dark brown and the scutum is clothed with moderately large light bronzy scales with a patch of white scales above the wing root and in front of the scutellum. Dorsocentral bristles are present at least posteriorly with three to five pairs of prescutellars. A single posterior pronotal bristle is present in some specimens but in others this cannot be made out; there are usually two spiracular bristles. The pleura are clothed with flat white scales and the posterior pronota are pale scaled below and bronzy or grey above.

*Legs:* The coxae are pale scaled laterally, the femora and tibiae are pale beneath but otherwise the legs are dark. The hind tibia is about 90% the length of the mid.

*Wings* (Plate xii, e): The scaling is dense, the outstanding scales on all veins long and narrow. The upper fork cell is 2.5 the length of its stem and its base is considerably proximal to that of the lower cell.

*Abdomen:* The tergites have large apical lateral patches of white in the form of distinct triangles giving a markedly serrate junction to the colours. The venter is pale.

*Male.*

This sex closely resembles the female except that the palpi are as long as the proboscis. The lobes of the ninth tergite (Text-fig. 41) are not widely separated, longer at the outer margin and bearing about five strong spines. The venter is banded at least on the posterior segments.

*Larva.*

The antennal shaft hair arises at about two-thirds from the base and is a stout divided spine; beyond this the antenna is distinctly narrower than below. The clypeal spines are moderately stout and curved with a tuft of very fine hairs at the tip. Head hair A is long and trifid, B is long with four to six branches and C is four- to five-branched. Both the latter are well in front of the level of A. Hair d is further in front still and bifid.

Both mesothoracic and metathoracic spines are present (Text-fig. 68). The stellate tufts of the thorax and abdomen are strongly developed, each branch being plumose with a minutely divided tip.

The lateral comb arises from a chitinous plate, the teeth are long, strong, with rounded tips and below those arising from the plate are a further series of finer spines often extending to the ventral surface. The first pentad hair is a strongly developed stellate tuft, the second single, the third with about four branches, the fourth long and single and the fifth similar to the third. The siphon is short with twelve to thirteen ventral tufts most of which are bifid but the basal pair may be trifid. The dorsal hairs

are mostly bifid, the lower ones being fairly stout. The saddle has a strong fringe of spines distally and the saddle hair has three or four branches. The dorsal subcaudal is five-branched, the ventral subcaudal is single and the ventral tuft has also about five short branches. The anal papillae are short and pointed. The terminal segments are illustrated in Text-figure 69.

*Biology*: The larvae are usually found in treeholes, tanks and water barrels.

*Distribution*: I have seen specimens from the vicinity of Sydney, Queanbeyan, 20.ii.43 (D. F. Waterhouse), and Mt. Victoria, 13.i.44 (R. H. Wharton).

#### TRIPTEROIDES (MIMETEOMYIA) PUNCTOLATERALIS (Theobald).

THEOBOLD, F. V., 1903.—*Entom.*, 36: 156 (*Stegomyia*).

EDWARDS, F. W., 1927.—Nova Guinea (Zoologie), 15: 352 (*Rachionotomyia*).

*Types*: Types of both sexes presumably in British Museum.

*Type Locality*: Southern Queensland.

*Synonymy*: *Stegomyia punctolateralis*, Theobald 1903. Loc. cit. *Rachionotomyia atripes* var. *punctolateralis*, Edwards 1927. Loc. cit. *Tripteroides atripes* var. *occidentalis* Brug, S. L., 1934. *Bull. ent. Res.*, 25: 506.

#### DISTINCTIVE CHARACTERS.

*T. punctolateralis* appears to be a distinct species, closely allied to *T. atripes*, but differing in its generally paler colouration. The head is fawn above, instead of black, the scales of the posterior pronota are distinctly white all over, and the scutal scaling is generally a paler brown. The proboscis is shorter than the abdomen but longer (7:6) than the fore femur. The scales of the scutellum are very light, appearing whitish in some lights, fewer dorsocentral bristles are present, and in the male, at least the basal third of the palpi are whitish scaled and there are pale reflections at the base of the proboscis as well. Some pale scaling is present at the base of the proboscis of the female also but it may be difficult to see. The pale abdominal bands are visible dorsally and even unite above on segment VIII.

I have taken as a basis for this species a series of specimens in the Macleay Museum, which although unlabelled as to collector or locality, were separated as *T. atripes* var. *punctolateralis* and could be recognized as specimens collected and mounted by Bancroft. A similar series in the Brisbane Museum, examined by Miss E. N. Marks, is almost certainly the same and neither series agrees with Theobald's description in certain characters. Nevertheless, it seems likely that Theobald overlooked the pale scaling at the base of the proboscis and palpi when he described this species and this has been the cause of subsequent confusion. It is significant that Edwards (1927) considered specimens from Atapoepe, Timor, as the same as *T. punctolateralis* even though Brug later described these same specimens as a new variety (*T. atripes* var. *occidentalis*). Other material that I have examined from northern Queensland and the Northern Territory cannot be differentiated from the supposed series of *T. punctolateralis* and also fits Brug's description of *T. atripes* var. *occidentalis* perfectly. Hence I feel that the latter must now go into the synonymy of *T. punctolateralis*.

Text-figure 42 illustrates the ninth tergite of a male specimen from the *T. punctolateralis* series in the Macleay Museum. Although the separation of the lobes appeared distinctly angular in this specimen, in contrast to the rounded indentation usually found, other specimens examined from the Northern Territory had the usual rounded indentation and so it does not appear possible to differentiate the genitalia of this species from those of *T. atripes*.

The only series of larvae correlated with specimens identified by me as *T. punctolateralis* came from Adelaide River, Northern Territory, and although they are almost identical with those of *T. atripes* it does appear possible to distinguish them on the branching of the dorsal head hairs. Hair A is usually bifid (instead of four-branched), B has three branches (instead of six), C has three to five (instead of usually five), and in both, d is bifid. All other characters appear to be as detailed for *T. atripes*. A larval specimen from Karumba was in agreement with those from Adelaide River.

*Biology*: Bancroft (1908) records this as a biting mosquito and says that the larvae are found in water butts and tanks. The Adelaide R. material was bred from larvae found in rot holes in fallen logs.

*Distribution*: South Queensland (Bancroft); Karumba, north Queensland (F./Sgt. S. J. Stewart, R.A.A.F., 20.xi.44); Adelaide R., Northern Territory (A. R. Woodhill, 1943) and Atapoepe, Timor.

#### TRIPTEROIDES (MIMETEOMYIA) SOLOMONIS (Edwards).

EDWARDS, F. W., 1924.—*Bull. ent. Res.*, 14: 363 (*Rachionotomyia*).

PAINE, R. W., and EDWARDS, F. W., 1929.—*Ibid.*, 20: 308 (*Rachionotomyia*—description of larva).

*Type*: Type female in British Museum.

*Type Locality*: Tulagi, Guadalcanal, Solomon Islands.

*Synonymy*: *Rachionotomyia solomonis*, Edwards 1924. Loc. cit.

#### DISTINCTIVE CHARACTERS.

Edwards differentiated this species from *T. atripes* as follows: "general colouration much darker; scutal scales black, but with a conspicuous margin of pure white scales around the bare space in front of the scutellum, also more numerous white scales in front of the mesonotum; dorsum of abdomen with a strong bluish gloss; front and middle femora much less extensively white beneath; upper fork cell relatively somewhat longer". On this information and on the basis of a single female specimen from Tenaru (L. J. Dumbleton), I have been able to differentiate *T. solomonis* from *T. atripes*. The characters of most importance are the black scutal scales and the restriction of dorso-central bristles to the posterior third of the scutum; also there is no white scaling at the base of the palpi or the proboscis (cf. *T. punctolateralis*) and the lateral abdominal markings are not visible dorsally.

Again, in the description of the larva of *T. solomonis* (Paine and Edwards, 1929), there is little to distinguish this species from *T. atripes*, the only obvious characters of value being the lack of a series of finer lateral comb spines arising below those attached to the lateral chitinous plate and the sharply pointed nature of those arising from the chitinous plate, these being quite distinct from the blunt spines of *T. atripes*.

The male has not been described.

*Biology*: The larvae were found in coconut husks.

*Distribution*: Tulagi, Ufa, Fai-ami and Tenaru, all localities in the Solomon Islands.

#### TRIPTEROIDES (MIMETEOMYIA) DIGOELENSIS Brug.

BRUG, S. L., 1934.—*Bull. ent. Res.*, 25: 506.

*Type*: Single male in British Museum.

*Type Locality*: Tanah Merah, Upper Digoel R., Dutch New Guinea.

#### DISTINCTIVE CHARACTERS.

This species is scarcely adequately described but it apparently does not come into the group of species with long proboscis (proboscis is equal to fore femur). The three spiracular bristles are yellow, there is a posterior pronotal bristle but no upper sternopleural. The base of the upper fork cell is nearer to the base of the wing than that of the lower cell and the former is 3.5 times the length of its stem. The separation of the abdominal colours is straight (this is quite distinct from the other species with short proboscis and long male palpi) and the lobes of the ninth tergite are deeply separated, each lobe bearing six bristles a little longer than the lobes.

Neither the female nor the larva has yet been described.

*Biology*: A nepenthicolous species.

*Distribution*: Only known from the type locality.

#### CALEDONICA-GROUP.

The members of this group are distinguished by the proboscis which is longer than the abdomen and slender. Three species, *T. caledonica*, *T. rotumana* and *T. tasmaniensis*, are readily recognized by the confinement of the pleural scaling to longitudinal bands. The rest of the species have the pleura normally covered, with pale scales over almost

the whole surface. Of these *T. argenteiventris* and *T. atra* are very closely related, with no striking characters of distinction, *T. microlepis* has the scutal scaling very small and *T. collessi* is distinguished by its banded venter in both sexes.

TRIPTEROIDES (MIMETEOMYIA) CALEDONICA (Edwards).

EDWARDS, F. W., 1922.—*Bull. ent. Res.*, 13: 100 (*Rachionotomyia*).

BUXTON, P. A., and HOPKINS, G. H., 1927.—*Res. in Polynesia*: 74 (*Rachionotomyia*—description of larva).

LEE, D. J., 1944.—*Atlas of Mosquito Larvae of the Australasian Region*. Australian Military Forces (Restricted): 22 (larval description).

*Types*: One male and one female cotypes in British Museum.

*Type Locality*: Houailou, New Caledonia.

*Synonymy*: *Rachionotomyia caledonica*, Edwards 1922. Loc. cit.

DISTINCTIVE CHARACTERS.

This species is only likely to be confused with *T. rotumana* from which it differs in having the pale abdominal bands situated apically and continuous across the dorsum instead of basally and laterally as in *T. rotumana*. The larva, although superficially resembling *T. bimaculipes*, is quite distinct since hair 7 of the mesothorax is not noticeably modified. *T. alboscuteolata* is similar in this feature but has the lateral comb of the eighth abdominal segment arising from a distinct chitinous lateral plate. The differentiation of *T. rotumana* is detailed under that species.

The proboscis is very long and slender, the female palpi extend beyond the clypeus almost twice its length and the male palpi are about two-thirds the length of the proboscis. The scutal scaling is very small, narrow and curved, and the pale pleural scaling is confined to a median diagonal band beneath which the integument is pale, in strong contrast to the dark brown integument above and below. Dorsocentral bristles are present, together with about five pairs of prescutellars, a single posterior pronotal, one to three spiraculars and an upper sternopleural. The abdomen has the tergites pale banded apically, the bands being of even width and continuous across the dorsum. The venter is entirely pale. The lobes of the ninth tergite are small, distinctly separated, with from three to seven long spines distally (see Text-fig. 40).

*Larva.*

The clypeal spines are only slightly curved, head hair A is bifid and B, C and d are single. Their disposition is apparent in Text-figure 64. The antennal shaft hair is bifid.

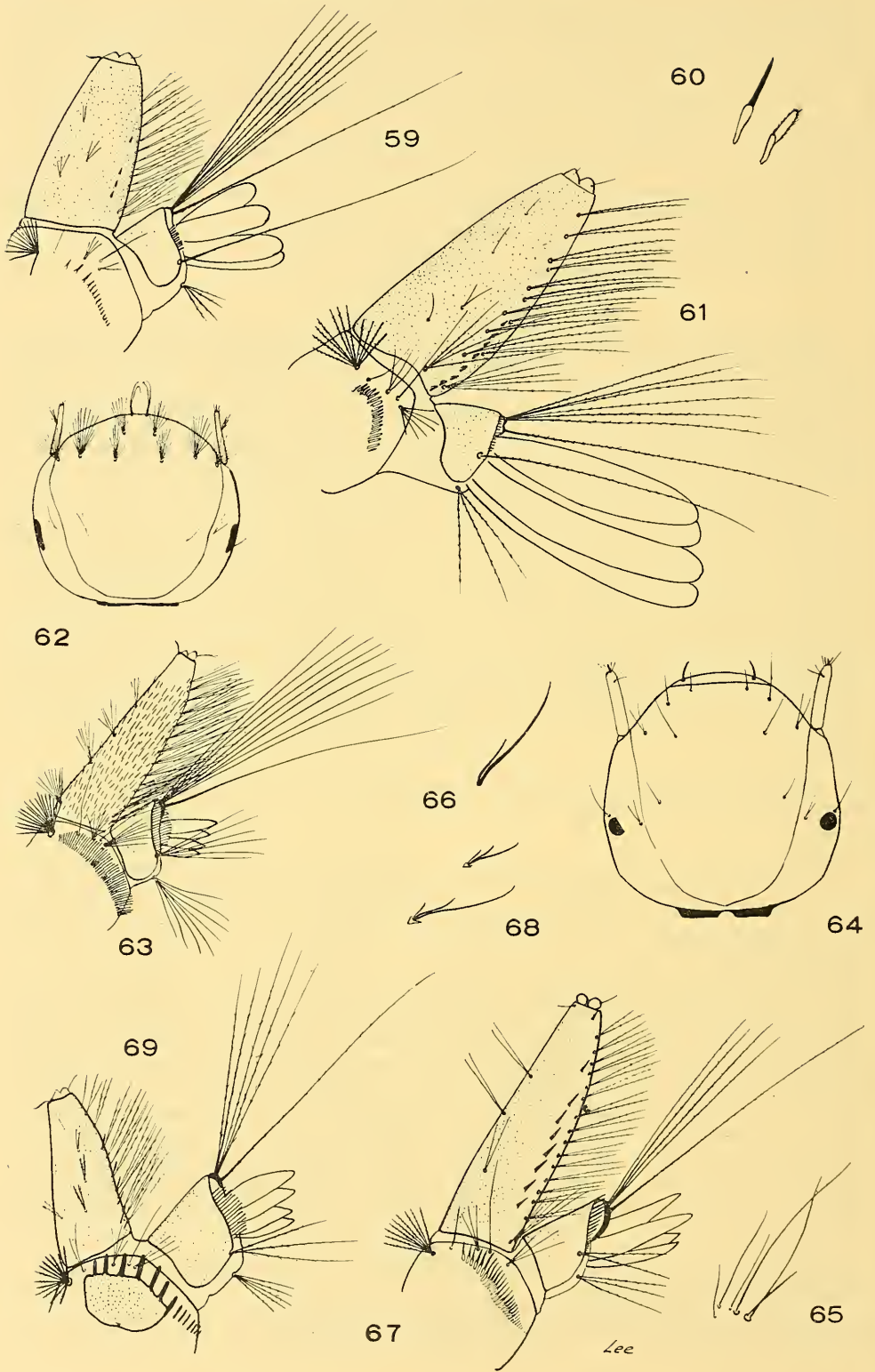
The mesothoracic hairs (2-7) are shown in Text-figure 65. Hair 7 of the metathorax is a strongly developed spine with one very long and one short branch (Text-fig. 66).

The stellate tufts of the thorax and abdomen have from nine to fourteen branches each of which is finely spinose and terminates in a minutely divided tip and the points are non-divergent.

The lateral comb of the eighth abdominal segment is very regular, comprising some thirty or more spines, the subdorsal ones being the largest. The first pentad hair is a well-developed stellate tuft, the second is single, the third is trifid and moderately long, the fourth long and single and the fifth trifid and also moderately long. The siphon is rather long with thirteen to fifteen bifid or trifid ventral hair tufts and a distinct pecten of about eight rather short spines. The dorsal hairs are bifid. The saddle terminates distally in a very strong fringe of spines the size of which decreases towards the saddle hair which is bifid. The ventral tuft is a three-branched plumose hair, the dorsal subcaudal has four such branches and the ventral subcaudal one. The anal papillae are rather longer than the saddle. The terminal segments are illustrated in Text-figure 67.

*Biology*: The larvae were originally recorded from *Nepenthes* but have since been found commonly in treeholes.

*Distribution*: I have examined specimens from New Caledonia, Efate (New Hebrides) and Havannah (New Hebrides). All were collected by L. J. Dumbleton.





## TRIPTEROIDES (MIMETEOMYIA) ROTUMANA (Edwards).

EDWARDS, F. W., 1929.—*Bull. ent. Res.*, 20: 337 (*Rachionotomyia*).

*Types*: Type male, one other male and five females in the British Museum.

*Type Locality*: Rotuma Island, north of Fiji.

*Synonymy*: *Rachionotomyia rotumana*, Edwards 1929. Loc. cit.

## DISTINCTIVE CHARACTERS.

This species is only to be confused with *T. caledonica* from which it is distinct in having lateral basal creamy spots on the tergites which are larger and just visible dorsally on the last few segments, in contrast to the continuous apical bands of *T. caledonica*.

According to Edwards (1929) the larva is similar in many respects to that of *T. caledonica* but "the metathoracic spines are very inconspicuous and bristle-like, fully half as long and very little thicker than the hairs in the large thoracic tufts; the two 'spines' subequal in length (in *T. caledonica* one is much shorter than the other). Siphon shorter (index about 2), with rather fewer postero-ventral hair tufts (about 10 instead of 13-16)".

*Biology*: The larval habitat has not been recorded.

*Distribution*: The species is still only known from Rotuma I.

## TRIPTEROIDES (MIMETEOMYIA) TASMANIENSIS (Strickland).

STRICKLAND, C., 1911.—*Entom.*, 44: 249 (*Stegomyia*).

TAYLOR, F. H., 1916.—*Proc. Linn. Soc. N.S.W.*, 41: 564 (*Stegomyia*).

EDWARDS, F. W., 1924.—*Bull. ent. Res.*, 14: 362 (*Rachionotomyia*).

LEE, D. J., 1944.—*Atlas of Mosquito Larvae of the Australasian Region*. Australian Military Forces (Restricted): 21 (larval description).

*Types*: Described from four females. Type in British Museum.

*Type Locality*: Tasmania.

*Synonymy*: *Stegomyia tasmaniensis*, Strickland 1911. Loc. cit., *Rachionotomyia cephasi* Edwards, F. W., 1923. *Bull. ent. Res.*, 14: 8 (Hole Creek, Tasmania—type and one other female in British Museum). *Rachionotomyia tasmaniensis*, Edwards 1924. Loc. cit.

## DISTINCTIVE CHARACTERS.

This species is closest to *T. caledonica* in having rather small scutal scales, dorso-central bristles and incompletely scaled pleura although the bare area of *T. tasmaniensis* corresponds with the scaled area of *T. caledonica*. From *T. caledonica* and *T. rotumana*, and indeed all other unornamented species it is distinct in having white tipped femora and tibiae and the apical tarsi white, if not entirely, then all but a dark dorsal line.

The larvae should not readily be confused with those of other species and the absence of modified hairs on the thorax, the blunt lateral comb scales and the greatly enlarged anal papillae should prove distinctive.

*Male.*

*Head*: The head is entirely dark dorsally, pale laterally and with an incomplete narrow pale border to the eyes. The palpi are 0.8 the length of the proboscis which in its turn is 1.25 the length of the fore femur.

*Thorax*: The integument is brown to dark brown, the scutal scales are small (but not as small as in *T. caledonica*), narrow and curved. Dorsocentral bristles are present and there are two to three pairs of prescutellars. There is a single posterior pronotal bristle, two spiraculars and a strong upper sternopleural. The pronotal lobes are pale scaled, the posterior pronota pale below and brown scaled above. There is a band of pale scales on the pleura from the lower part of the posterior pronota distally to the upper third of the mesepimeron. Below this is a distinct bare stripe, broadest across the middle of the mesepimeron, and below this again the pleura are pale scaled.

Text-figs. 59-69.—Larval structures of unornamented species of *Tripteroides* (*Mimeteomyia*). 59, 61, 62, 63, 64, 65, 66, 67, 68 and 69  $\times$  40 approx.; 60  $\times$  100 approx.

59-60. *T. argenteiventris*. 59. Terminal segments. 60. Lateral comb scales. 61. *T. tasmaniensis*, terminal segments. 62-63. *T. collessi*. 62. Head (dorsal). 63. Terminal segments. 64-67. *T. caledonica*. 64. Head (dorsal). 65. Mesothoracic hairs 2-7. 66. Metathoracic spine. 67. Terminal segments. 68-69. *T. atripes*. 68. Mesothoracic and metathoracic spines. 69. Terminal segments.

*Legs:* The legs are conspicuous for their white tipped femora and tibiae and the pale scaling of hind tarsi III-V, at least ventrally and laterally.

*Wings:* The outstanding scales are long and narrow and the base of the upper fork cell is considerably nearer the base of the wing than that of the lower cell. The upper cell is also about five times the length of its stem.

*Abdomen:* This is brown dorsally with pale lateral markings in the form of small apical triangles interrupted by dark areas at the bases of each segment. The venter is largely but not entirely pale scaled, brown scales being irregularly present.

*Genitalia:* The coxites are rather long and narrow, and the lobes of the ninth tergite are of only moderate size, separated, and carrying some nine distal spines (see Text-fig. 37).

*Larva.*

Head hair A is four-branched, B is fairly long and single and behind the level of A, C is bifid or trifid and close to the anterior margin at the level of hair d which is bifid. The clypeal spines are fairly long and curved and the antennal shaft hair is single.

There are no modified hairs on the thorax and the stellate tufts of both the thorax and abdomen have from five to twelve branches (usually eight to ten on the abdomen) and each branch is very inconspicuously frayed with a divided but non-divergent point.

The lateral comb comprises a row of some twenty fringed spines with bluntly rounded ends. The first pentad hair is a strongly developed stellate tuft, the second is simple, the third with three or four branches, the fourth is exceptionally long and single and the fifth has some six branches. The siphon is rather stout, its index a little more than two, with a pecten of about eight multidentate teeth extending from the base to almost halfway. The two basal hairs of the ventral tufts have four to five branches and are followed by an irregular series of eleven bifid hairs. All are long and finely plumose. The dorsal hairs are short and single or bifid. There is a row of dentate spines at the distal margin of the saddle, the saddle hair is long and single, there are six branches in the dorsal subcaudal, one in the ventral subcaudal, and the ventral tuft is trifid; all these hairs are plumose. The anal papillae are very long and sausage-shaped. The terminal segments are illustrated in Text-figure 61.

*Biology:* All larval records have been from small rock pools in mountain streams or treeholes.

*Distribution:* The species is known to occur in Tasmania and the eastern portion of New South Wales. Tasmania: Waratah, 13.iii.16; Ferntree Gully, ii.28 (Irwin Smith); Mt. Wellington, 1.xii.22 (A. Tonnoir); Harz Mt., 9.xii.22 (A. Tonnoir); King R., 4.ii.23 (A. Tonnoir); Eaglehawk Neck, 23.xi.22 (A. Tonnoir). New South Wales: Barrington, 1.25 (S.U. Zoo. Exp.); National Park, 12.iv.25, 1.i.26 (Mackerras); Mosman Bay; Mt. Victoria, 3.i.44 (R. H. Wharton); Northwood, 19.xi.40 (A. R. Woodhill).

TRIPTEROIDES (MIMETEOMYIA) ARGENTEIVENTRIS (Theobald).

THEOBALD, F. V., 1905.—*Ann. Nat. Mus. Hung.*, 3: 118 (*Polylepidomyia*).

EDWARDS, F. W., 1924.—*Bull. ent. Res.*, 14: 361 (*Rachionotomyia*).

BRUG, S. L., 1934.—*Ibid.*, 25: 510 (includes larval description).

*Types:* Described from five females. Type in National Museum of Hungary, one paratype in British Museum.

*Type Locality:* Paumomu R., Papua (almost certainly Paimumu R., opposite Yule Island—146° 45' E. by 8° 50' S.).

*Synonymy:* *Polylepidomyia argenteiventris*, Theobald 1905. Loc. cit. *Rachionotomyia argenteiventris*, Edwards 1924. Loc. cit.

DISTINCTIVE CHARACTERS.

*T. argenteiventris* will not be confused with *T. caledonica*, *T. rotumana* or *T. tasmaniensis* since the pleura are wholly covered with pale scales instead of having the scaling confined to longitudinal stripes. The large scutal scales immediately differentiate it from *T. microlepis*, and the entirely white venter from *T. collessi*. As only the female of *T. atra* is known it is only possible to distinguish the female from the former on the length of the palpi (one-sixth of the proboscis in *T. atra*, one-tenth in *T. argenteiventris*). The larva of *T. argenteiventris* will only be confused with that

of *T. tasmaniensis*, these being the only two species without modified maxillae in which both mesothoracic and metathoracic spines are absent, but the pointed lateral comb spines of the former are in contrast to the blunt fringed spines of the latter.

## DESCRIPTION.

(Based on Milne Bay material.)

*Male.*

*Head:* This is dark, almost black scaled above with the upright forked scales yellowish at the centre of the nape and a very narrow pale border to the eyes which is often obscured by the overhanging dark scales. The clypeus is light brown and the proboscis black, long and slender and 1.3 the length of the fore femur. The palpi are almost as long as the proboscis (85:95).

*Thorax:* The scutal scaling is broad, dense and dark brown. The thoracic integument, including the pleura, is dark brown; there are no dorsocentral bristles but three to four pairs of prescutellars are present. The pleura are clothed with pale scales but the upper part of the posterior pronota are dark brown. There is a single posterior pronotal bristle, two to three spiraculars and one upper sternopleural.

*Legs:* The femora are pale beneath to the tip, otherwise the legs are dark scaled. The hind tibia is 88% the length of the mid.

*Wings* (Plate xiii, *e*): These are clothed with narrow outstanding scales on all veins. The base of the upper fork cell is nearer the base of the wing than that of the lower cell and the former is about 2.7 the length of its stem.

*Abdomen:* The abdomen is blackish dorsally with lateral pale markings separated by a straight line. The venter is pale scaled.

*Genitalia:* The lobes of the ninth tergite (Text-fig. 39) are separated but small, with some six to ten spines arranged around the margin.

*Female.*

Generally the female is very similar to the male but there are a few pale flat scales at the centre of the nape; the palpi are 0.1 the length of the proboscis and exceed the clypeus by less than 1.5 the length of the latter. The hind tibia is about 92% the length of the mid and the upper fork cell is 3.0 the length of its stem.

*Larva.*

The antennae are slightly swollen at the middle and the shaft hair is long, single and arising at three-quarters from the base. The clypeal spines are moderately stout, curved and divided into two close-set branches at half-way (in occasional specimens from both Milne Bay and Hollandia they are not divided). Head hair A has some four to eight fine, rather long branches; B is similar but usually with fewer branches and is situated in front of the level of A; C is long with two branches and arises behind the level of A and d is single or bifid, of moderate length and near the anterior margin of the head; e is single and f is bifid. All the hairs are very fine and limp.

There are no modified hairs on the thorax. The stellate tufts of the thorax and the abdomen have rather fine though numerous branches, finely frayed, with their apices divided into two or more minute points.

The lateral comb (individual spines are shown in Text-figure 60) comprises a row of six to fifteen teeth of which the upper ones are sharply pointed but the more ventral ones may be rounded and fringed (the latter are not always present). The first pentad hair is a stellate tuft, similar to the rest, the second is single and rather short, the third is of similar length with about three or four branches, the fourth is long and single and the fifth is either similar to the second or bifid. The siphonal index is about 2.0; the pecten comprises two to six small fringed pointed spines. There are eleven to twelve ventral tufts mostly bifid or trifid but the basal pair may have four branches; the dorsal hairs have three to four branches. The saddle has a row of coarse spines distally and the saddle hair is single or occasionally bifid. The dorsal subcaudal has about eight branches, the ventral subcaudal is single and the ventral tuft is usually six-branched. The anal papillae are considerably longer than the saddle and sausage-shaped. The terminal segments are illustrated in Text-figure 59.

**Biology:** The larvae have been found in relatively fresh water in tins and old coconuts at Milne Bay by D. A. C. Cameron and in treeholes at Hollandia by W. V. King. Some specimens have been taken biting.

**Distribution:** I have examined specimens from the following localities: Milne Bay, 1943 (D. Cameron); ix.43 (Ratcliffe); x.43 (W. V. King); Tsili Tsili, ix.43 (W. V. King); Nadzab, ix.43 (W. V. King); Dobodura, ix.43 (Ratcliffe); x.43 (W. V. King); Lae, xi.43 (Ratcliffe); Hollandia, 28.iii.45; 10.iv.45; 16.iii.45; 2.iv.45 (all collected by 19th Med. Gen. Lab.); undated, 220th Mal. Surv. Unit, U.S. Army.

#### TRIPTEROIDES (MIMETEOMYIA) ATRA (Taylor).

TAYLOR, F. H., 1914.—*Trans. ent. Soc. Lond.*, 1914: 190 (*Stegomyia*).

NEC EDWARDS, F. W., 1924.—*Bull. ent. Res.*, 14: 362 (*Rachionotomyia*).

NEC ———, 1927.—*Nova Guinea (Zoologie)*, 15: 353 (*Rachionotomyia*).

**Types:** Described from three females, of which at least one was not conspecific with the holotype, which is in the School of Public Health and Tropical Medicine, University of Sydney.

**Type Locality:** Lakekamu Goldfield, Papua.

**Synonymy:** *Stegomyia atra*, Taylor 1914. Loc. cit. Nec *Rachionotomyia atra*, Edwards 1924. Loc. cit. *Rachionotomyia brugi* Edwards, F. W., 1927. *Nova Guinea (Zoologie)*, 15: 356 (described from ten females, in the British Museum; type locality, Nassau Mts., Dutch New Guinea (1,500 metres)).

**Note.**—Due to the fact that Edwards viewed a paratype of *T. atra* which was not conspecific with the type it has usually been assumed that *T. atra* was a species with all the outstanding wing scales broad (hence a *Rachisoura*). The type, however, has only narrow outstanding wing scales and appears to agree in all details with *T. brugi*, hence I have placed the latter in its synonymy.

#### DISTINCTIVE CHARACTERS.

I have identified a series of fifteen female specimens from various elevations on Mt. Dafonsero as this species. They are very similar to *T. argenteiventris* but may best be distinguished on the length of the palpi which are one-sixth the length of the proboscis and extend beyond the clypeus for twice the length of the latter. Amongst the series are two specimens in which the palpi are shorter and come within the limits of *T. argenteiventris* but it is unlikely that they are really this species. The length of the upper fork cell may also be useful, it varies from 2.5 to almost 3.0 times the length of its stem.

Edwards, in his description of *T. brugi*, does not mention the lack of dorsocentral bristles and in his comparative table indicates that only one pair of prescutellar bristles is present. In the specimens before me the alveoli of three or four pairs of prescutellars may be seen and in a specimen from the Upper Rouffaer R., identified by Brug as *T. brugi*, two pairs of prescutellars are quite distinct.

Neither the male nor the larva is yet known.

**Biology:** The adult female is a diurnal biting species, most specimens from Mt. Dafonsero having been taken biting.

**Distribution:** I have examined specimens from the following localities: Upper Rouffaer R., i.27 (V. Leeuwijn); Mt. Dafonsero, biting between noon and 4 p.m. in mossy forest, 18.iv.45; biting at altitudes from 950 to 1,385 metres, 1.iii.45; biting in rain forest at 770 metres, 21.iv.45; biting at creek at noon, 770 metres; mountains above Doromena, 21.iv.45; biting in rain forest, 400 metres (all the above collected by 19th Med. Gen. Lab.).

#### TRIPTEROIDES (MIMETEOMYIA) MICROLEPIS (Edwards).

EDWARDS, F. W., 1927.—*Nova Guinea (Zoologie)*, 15: 353 (*Rachionotomyia*).

**Type:** Described from a single female in the British Museum.

**Type Locality:** Nassau Mts., Dutch New Guinea (1,500 metres).

**Synonymy:** *Rachionotomyia microlepis*, Edwards 1927. Loc. cit.

#### DISTINCTIVE CHARACTERS.

I have identified some twenty-seven specimens taken on Mt. Dafonsero as *T. microlepis* since they agree very closely with the description of that species. Although Edwards describes the species (from a single specimen) as lacking a posterior pronotal bristle I have found that this is usually but not always present. It is often strong, sometimes weak and in other specimens not even a pit from which such a bristle may

have arisen can be seen. According to Edwards the spiracular bristles are golden but in most of those before me they are black but in occasional specimens they are pale brown. The only other character at variance from the description is the abdominal markings which are usually indefinite but occasionally they may appear triangular on the more posterior tergites. Since the specimens before me almost certainly comprise a single species I feel that, in view of their variability, it would not be sound to consider them distinct from *T. microlepis*.

The species may be recognized by the long slender proboscis in association with the very small scutal scaling. In general characters there is considerable resemblance to *T. caledonica* and *T. rotumana* but the evenly dark pleural integument of *T. microlepis*, together with the almost complete covering of the pleura by pale scales, will at once be distinctive.

## DESCRIPTION.

(Mt. Dafonsero material.)

*Female.*

*Head*: The head is black scaled above, pale laterally and with a silvery rim to the eyes. The pedicels and clypeus are dark brown to black and the latter is bare. The palpi are short, exceeding the clypeus by about 1.5 to 2.0 times the length of the latter and the proboscis is long and slender and 1.25 the length of the fore femur.

*Thorax*: The thoracic integument is usually very dark, almost black. The scutal scaling is dark bronzy, the individual scales being very small, narrow and curved. There is a narrow area of pale scales above the wing root and at the anterior margin of the scutum. Dorsocentral bristles are present and there are two to three pairs of prescutellars. A dark posterior pronotal bristle is usually present but does appear to be absent in some specimens, there are two to four spiraculars and one or two pale upper sternopleurals. The pronotal lobes are pale scaled and the posterior pronota are pale scaled below and dark on the upper half.

*Legs*: The femora are pale beneath to the tip and there are also scattered pale areas beneath the tibiae. The hind tibiae are about 86% the length of the mid.

*Wings* (Plate xiii, a): The outstanding scales are long and narrow. The upper fork cell is about 2.3 times the length of its stem and its base is distinctly nearer the base of the wing than that of the lower cell.

*Abdomen*: This is dark above and the pale lateral areas of the tergites are not pronounced, with an indefinite margin. The venter is entirely pale.

Neither the male nor the larva has yet been discovered.

*Biology*: All the specimens I have examined were taken biting during the day at high altitudes.

*Distribution*: Apart from the type locality this species is only known from Mt. Dafonsero, Dutch New Guinea. Mt. Dafonsero (1,385 metres), 2.iii.45; 4.iii.45; (1,445 metres), 19.iv.45; (950-1,385 metres), no date (all collected by 19th Med. Gen. Lab.).

## TRIPTEROIDES (MIMETEOMYIA) COLLESSI, n. sp.

*Types*: Holotype male, allotype female, four male and four female paratypes, all with associated larval skins in the C.S.I.R. Collection; one male and two female paratypes with cast skins of the latter two in the British Museum; one paratype of each sex in the Macleay Museum; one male and two female paratypes with cast skins in the National Museum, Washington, and one paratype of each sex in the Brisbane Museum. All collected by D. H. Colless, 10.i.45.

*Type Locality*: Upper Barron, north Queensland.

## DISTINCTIVE CHARACTERS.

This species is quite a distinct one. The presence of dorsocentral bristles, the long proboscis, pale base to the palpi, distinct apical lateral triangles to the abdominal tergites together with the banded venter should distinguish it from all related species. The multi-branched head hairs of the larva (including the antennal shaft hair) together with the spinose siphon are distinctive characters.

## DESCRIPTION.

*Male.*

*Head:* Above, the head appears almost white in most lights, pale brownish in some. The pedicels and clypeus are brown, the palpi and proboscis are dark brown, the latter are pale scaled at the very base and both have pale reflections basally. The palpi are 0.75 the length of the proboscis which itself is slightly longer than the abdomen and 1.2 the length of the fore femur.

*Thorax:* The thoracic integument is dark brown, the scutal scales are dense, dark bronzy brown, moderately narrow and curved. Dorsocentral bristles are present together with three to five pairs of prescutellars. There is flat pale scaling over most of the pleura except the anterior half of the sternopleuron, the pronotal lobes are pale scaled and the posterior pronota pale below and bronzy brown above. There is a single posterior pronotal bristle, two spiraculars but no upper sternopleural.

*Legs:* The coxae are very pale with pale scaling laterally, the femora are pale beneath and at least the hind tibiae may appear so in some lights. Otherwise the legs are dark brown with the hind tibiae about 87% the length of the mid.

*Wings* (Plate xiii, *d*): The outstanding scales of all veins are long and narrow. The base of the upper fork cell is nearer the wing base than that of the lower cell and the length of the upper cell is 3.5 that of its stem.

*Abdomen:* This is dark brown above with distinct apical lateral pale triangles which do not extend quite to the bases of the segments. The venter is pale with very obvious dark basal bands on segments III-VII.

*Genitalia:* The lobes of the ninth tergite (Text-fig. 38) are well separated, rounded apically with from nine to fifteen spines.

*Female.*

This sex resembles the male closely but the palpi are very short, barely 0.1 the length of the proboscis and exceeding the clypeus by scarcely more than its length and with a distinct pale scaled basal area. The proboscis is 1.25 the length of the fore femur.

*Larva.*

The antennal shaft hair arises not much beyond half way and has twelve or more branches. The clypeal spines are long, stout, divided into two near the base, each arm tapering to a fine curved hair. The head hairs are most striking. A, B and C arise more or less in a line behind the level of the antennae, hair d is situated at somewhat less than half way to the anterior margin and all these hairs have from ten to twenty radiating plumose branches. Hairs e and f are bifid or trifid (see Text-fig. 62 for illustration of head).

The mesothoracic hairs are not obviously modified but there is a strongly developed spine on the metathorax with three (occasionally more) very uneven branches. The stellate hairs of both the thorax and abdomen are very strong with at least twenty dark plumose branches.

The lateral comb comprises a close set row of very many long fine spines of which those towards the ventral surface are the longest. The first pentad hair is a strongly developed stellate tuft, the second is long and single, the third is strong and multi-branched, the fourth long and single and the fifth stronger than the third and also multi-branched. The siphon tapers to the tip and its index is almost 3.0. There are some fifteen three- to four-branched plumose hair tufts ventrally but the pecten cannot be differentiated from the complete covering of pecten-like spines over the whole siphon. The dorsal hairs have about fifteen branches in the basal hairs decreasing to four or even two in the apical ones. The saddle has a strong fringe of long fine spines distally and the saddle hair has six plumose branches. The dorsal subcaudal is eight-branched, the ventral subcaudal is single and the ventral tuft has eight or nine branches. The anal papillae are scarcely as long as the saddle. The terminal segments are illustrated in Text-figure 63.

*Biology:* The type series was bred from larvae found in treeholes.

*Distribution:* As yet this species is only known from the type locality.

## OBSCURA-GROUP.

Only two species belong to this group, namely, *T. obscura* and *T. subobscura*. They are distinct from all other species of *Mimeteomyia* because of the palpi being about one-third the length of the proboscis in both sexes.

## TRIPTEROIDES (MIMETEOMYIA) SUBOBSCURA, n. sp.

*Types*: Holotype male and allotype female in the C.S.I.R. Collection and a paratype of each sex in the British Museum. All collected November, 1942, by I. M. Mackerras.

*Type Locality*: Jacky Jacky, Cape York, north Queensland.

## DISTINCTIVE CHARACTERS.

Both sexes are distinguishable from all but *T. obscura* on the length of the palpi. From the latter the lack of a posterior pronotal bristle and the strongly serrate abdominal markings are characters of distinction.

*Note*.—This species closely resembles *T. obscura* Brug even in the form of the ninth tergite, but owing to the lack of a posterior pronotal bristle on all four specimens, together with the very markedly serrate abdominal markings, I have deemed it wise to consider the present form a distinct species. Further study of material from Tanah Merah, or a comparison of larvae from the two localities, is necessary before the exact relationships of the two can be determined.

## DESCRIPTION.

*Male.*

*Head*: The scaling is black dorsally. The pedicels and clypeus are very dark and the latter is bare. The palpi and proboscis are black, the former being one-third the length of the proboscis and the latter is short, stout and 0.8 the length of the fore femur.

*Thorax*: The scutal integument is almost black, the scaling is black, dense, rather narrow medially but broad laterally. There are no dorsocentral bristles but two pairs of prescutellars are present. The pleural integument is brown, the scales on the pronotal lobes are pale with some darker ones dorsally and those on the posterior pronota are pale below and very dark on the upper half. There is no posterior pronotal bristle, four or five spiraculars and no upper sternopleural. The scutellum is black scaled and the postnotum is bare and dark brown.

*Legs*: The coxae are yellowish-brown with pale scaling laterally. The rest of the legs are black although the femora are pale beneath for about the basal two-thirds. The hind tibia is only 75% the length of the mid.

*Wings*: All the outstanding scales are long and narrow. The upper fork cell is three times the length of its stem and its base is distinctly nearer the base of the wing than that of the lower cell.

*Abdomen*: This is dark dorsally with distinct lateral pale triangles on the tergites, the junction of the colours being decidedly serrate.

*Genitalia*: The lobes of the ninth tergite are long, deeply separated with seven strong spines as shown in Text-figure 36.

*Female.*

This sex is very similar to the male. The palpi are not quite one-third the length of the proboscis and extend beyond the clypeus for four times its length. There are up to six spiracular bristles.

No larval material is available for description.

*Biology*: The holotype was bred from larvae found in *Nepenthes* spp.

*Distribution*: Only known from the type locality.

## TRIPTEROIDES (MIMETEOMYIA) OBSCURA\* Brug.

BRUG, S. L., 1934.—*Bull. ent. Res.*, 25: 504 (*T. obscurus*).

*Type*: Single male in British Museum.

*Type Locality*: Tanah Merah, Upper Digoel R., Dutch New Guinea.

\* The termination has been changed to the feminine in agreement with the genus.

## DISTINCTIVE CHARACTERS.

Within the group of species in which the outstanding wing scales are long and narrow the length of the palpi will distinguish this species from all but *T. subobscura*, under which species the characters of distinction are discussed. The ninth tergite as figured by Brug (1934) is apparently very similar to that of *T. subobscura* but there are only five spines on each lobe.

*Biology*: A nepenthicolous species.

*Distribution*: Only known from the type locality.

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## EXPLANATION OF PLATES XII-XIII.

Plate xii. All × 225.

(a) *T. argyroga*. (b) *T. filipes*. (c) *T. bisquamata*. (d) *T. concinna*. (e) *T. atripes*.

Plate xiii. All × 225.

(a) *T. microlepis*. (b) *T. splendens*. (c) *T. bimaculipes*. (d) *T. collessi*. (e) *T. argenteiventris*.



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 (Synonyms in italics.)

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